



Query/Plot

INTRODUCTION

EnSight can perform a number of different kinds of queries over time or space. The result is a Query Entity that can be plotted using EnSight's built-in [Plotting](#) facility or that can be printed as a table or written to a disk file.

BASIC OPERATION

One first must create query items, which can be any of the following types:

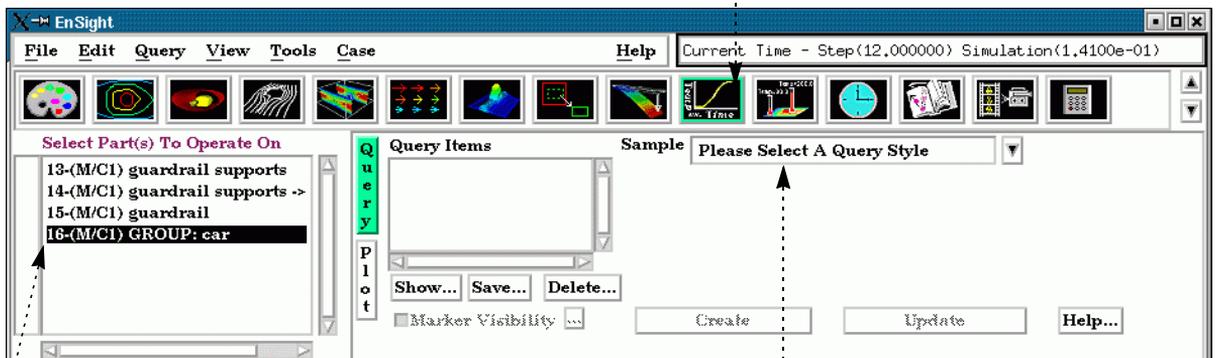
At Line Tool Over Distance. At 1D Part Over Distance.	At Node Over Time At Element Over Time At IJK Over Time At Cursor Over Time At Minimum Over Time At Maximum Over Time
By Operating on Existing Queries	
Read From An External File	

As one of these is selected, the Quick Interaction Area changes to reflect the information needed (such as variable to use) for the selected type. One can control whether the query entity will be a curve or a scatter plot by the choice for Variable 1 and 2.

Query entities can be printed to the Status History Area, saved to a file, deleted, or plotted.

Sample Query Creation and Plot (At Maximum Over time)

2. Click the Query/Plot icon (or select Query > Over Time/Distance...).



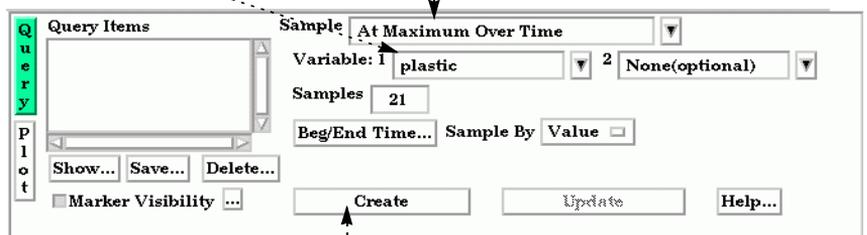
1. Select the part to query.

3. Select the Sample type for the query.

4. Select the variable for Variable: 1.

Leave Variable: 2 as None and it will default to Time, because of sample type.

5. Click Create

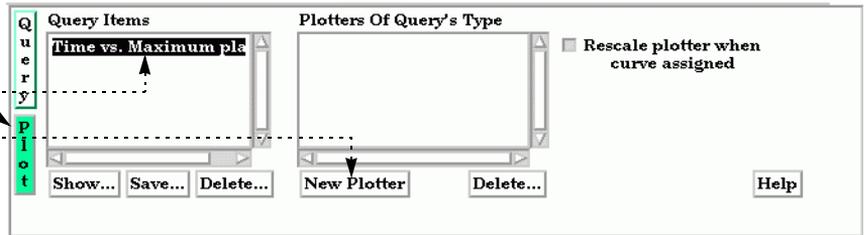




6. Click Plot

7. Select the Query Item to plot.

8. Click New Plotter.



Note: If any previous plotter has the correct type, it will show up in the list and can be selected instead of creating a new one, if desired.

The plot will be displayed in the graphics window and will be listed in the Plotters Of Query's Type list. For more information on plotting, see the [Plotting](#) section towards the end of this How To.

Managing Query Entities

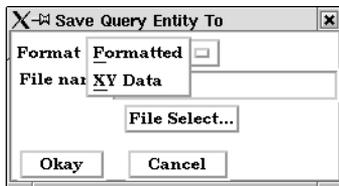
The Quick Interaction area provides various controls for managing existing Query Entities:

List of current Query Entities. Selected items are operated on by the following actions.

Plot the selected Query Entity as described above.

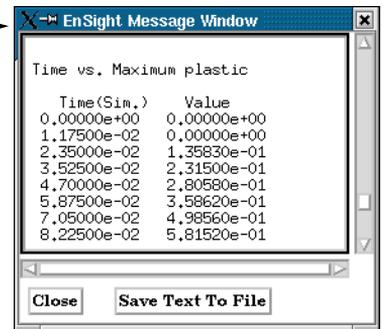
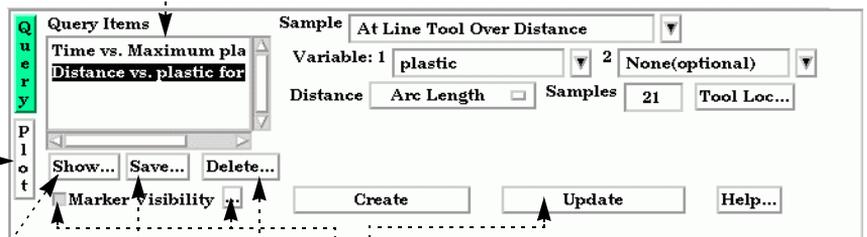
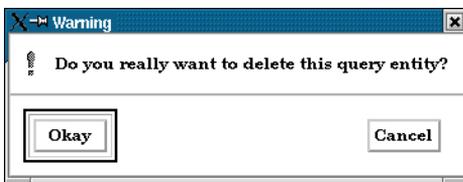
Print the text of the selected Query Entity to the Status History Area.

Save the selected Query Entity to a disk file, either as xy data or in a formatted report-like manner.



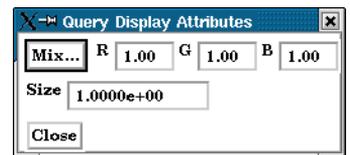
Note that previously created and saved query entities are restored through the use of the Read From An External File query Sample option.

Delete the selected Query Entity.



Update the selected query when any of its attributes or have been modified.

For various queries, marker visibility, as well as size and color can be controlled here as well.





Over Distance Queries

EnSight can perform queries at uniform points along the line tool or at nodes along a 1D part. One-dimensional parts include model parts consisting of bar elements, 1D (Line) Clips, and particle traces.

At Line Tool Over Distance.

After selecting the part to query and clicking the Query/Plot icon

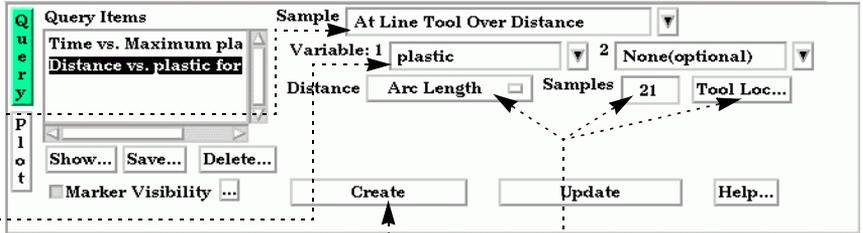
1. Select Sample as “At Line Tool Over Distance”

2. Select the variable to query over the distance in “Variable: 1”.

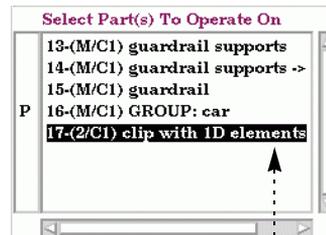
Leave “Variable: 2” as None unless you want a scatter query of two different variables along the line tool.

3. Optionally, select the Distance option desired, number of points along the line, and modify the tool location if needed.

4. Click Create



At 1D Part Over Distance.



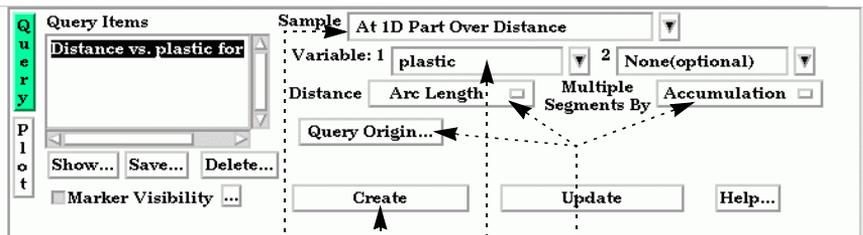
1. Select the 1D part

2. Select Sample as “At 1D Part Over Distance”

3. Select the variable to query in “Variable: 1”.

4. Optionally modify Distance, origin and multiple segment attributes.

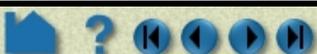
5. Click Create.



For the two over distance query types, the variable is plotted against the selected “Distance” metric. The node with the lowest node ID number is queried first. Since the nodes for 1D part over distance are not necessarily evenly spaced, the reported distance is one of the following:

Distance In Setting	Reported Distance
Arc Length	The distance along the part from the first node to each subsequent node (i.e. the sum of the 1D element lengths)
X Arc Length	The X coordinate value of each node accumulated from the start
Y Arc Length	The Y coordinate value of each node accumulated from the start
Z Arc Length	The Z coordinate value of each node accumulated from the start
From Origin	The distance from the origin
X From Origin	The X distance from the origin
Y From Origin	The Y distance from the origin
Z From Origin	The Z distance from the origin

If the 1D part contains more than one set of contiguous 1D elements (such as a particle trace from a Line emitter), the resulting query will contain one plot entity for each set.





Over Time Queries

For transient dataset, EnSight can query the variable values over a range of time at a particular node, element (or specific IJK coordinate for structured data) or an arbitrary point. You can also search the minimum or maximum of a variable over all nodes over a time range.

At Node Over Time

After selecting the part to query and clicking the Query/Plot icon

1. Select Sample as “At Node Over Time”

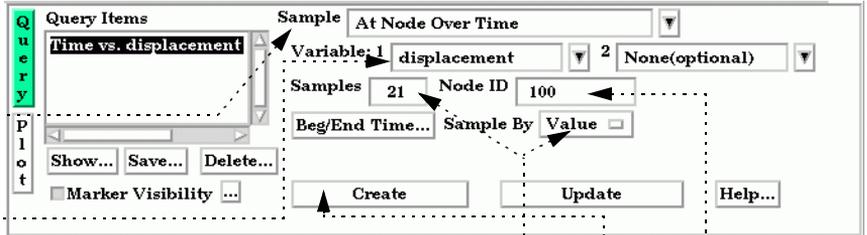
2. Select the variable to query over time in “Variable: 1”

Leave “Variable: 2” as None unless you want a scatter query of two different variables over time.

3. Enter the Node ID.

4. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

5. Click Create



At Element Over Time

After selecting the part to query and clicking the Query/Plot icon

1. Select Sample as “At Element Over Time”

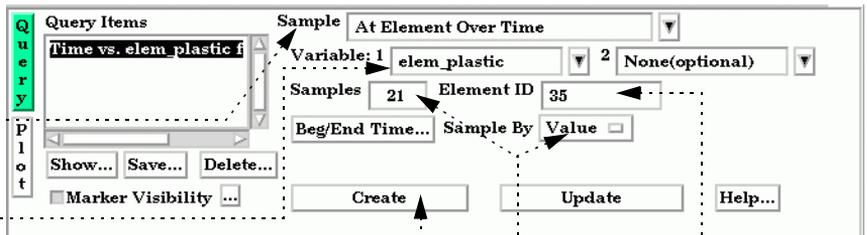
2. Select the variable to query over time in “Variable: 1”

Leave “Variable: 2” as None unless you want a scatter query of two different variables over time.

3. Enter the Element ID.

4. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

5. Click Create



At IJK Over Time

After selecting the part to query and clicking the Query/Plot icon

1. Select Sample as “At IJK Over Time”

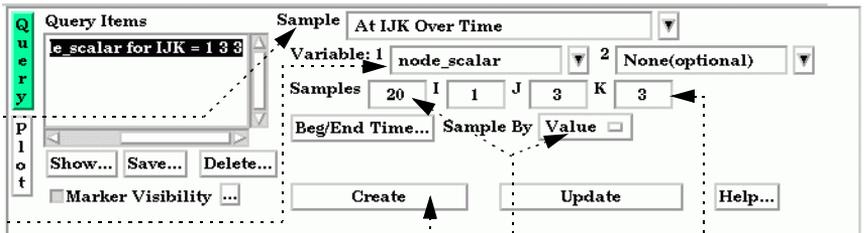
2. Select the variable to query in “Variable: 1”

Leave “Variable: 2” as None unless you want a scatter query of two different variables over time.

3. Enter IJK for the point.

4. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

5. Click Create





At Cursor Over Time

After selecting the part to query and clicking the Query/Plot icon

1. Select Sample as "At Cursor Over Time"

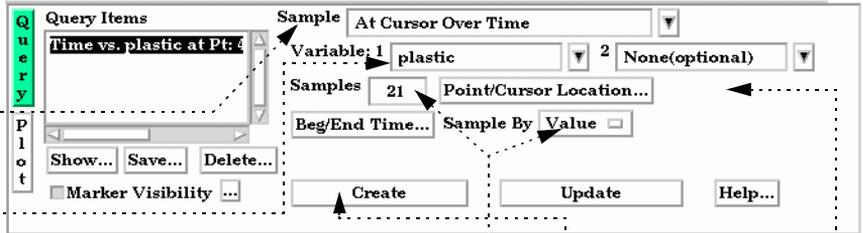
2. Select the variable to query over time in "Variable: 1"

Leave "Variable: 2" as None unless you want a scatter query of two different variables over time.

3. Place the cursor where desired in the model, either through picking, or other transformation methods. (Can get to the Transformation Editor through the Point/Cursor Location ... button.)

4. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

5. Click Create



At Minimum Over Time

After selecting the part to query and clicking the Query/Plot icon

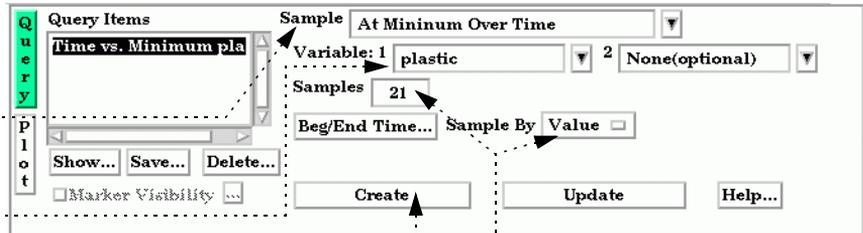
1. Select Sample as "At Minimum Over Time"

2. Select the variable to query over time in "Variable: 1"

Leave "Variable: 2" as None unless you want a scatter query of two different variables over time.

3. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

4. Click Create



At Maximum Over Time

After selecting the part to query and clicking the Query/Plot icon

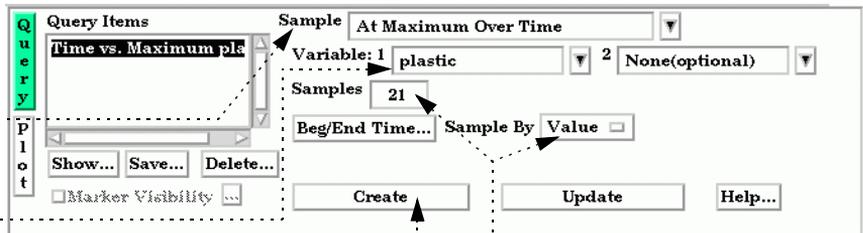
1. Select Sample as "At Maximum Over Time"

2. Select the variable to query over time in "Variable: 1"

Leave "Variable: 2" as None unless you want a scatter query of two different variables over time.

3. Optionally, change the number of Samples (defaults to number of time steps), and whether to sample by Value of FFT.

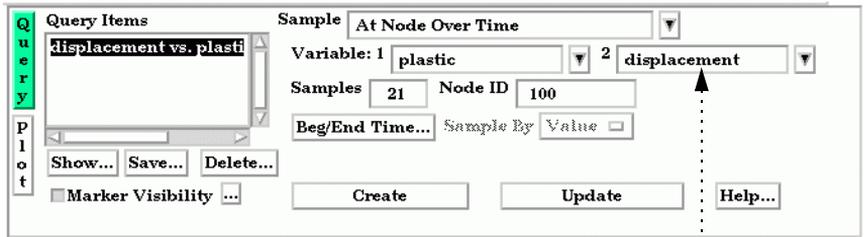
4. Click Create





Scatter Query Example

Everything is done like a regular query except you select another variable in the Variable: 2 field, instead of leaving it as None.



Operations on Existing Queries

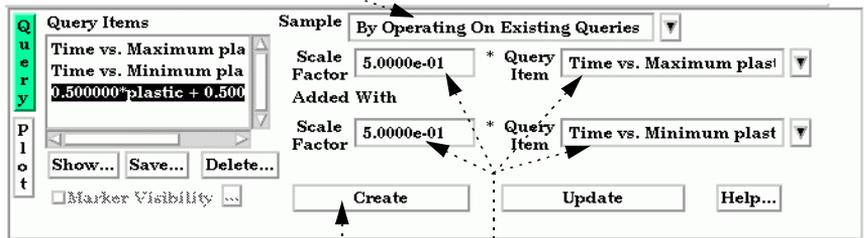
You can perform a scaling of an existing query, or a scaling and algebraic addition of two queries.

By Operating on Existing Queries

1. Select Sample as "By Operating On Existing Queries"

2. Select the Query Item and set the Scale Factor if you want to scale a single query - or - Select both Query Items and set both Scale Factors if you want to scale and add algebraically.

3. Click Create



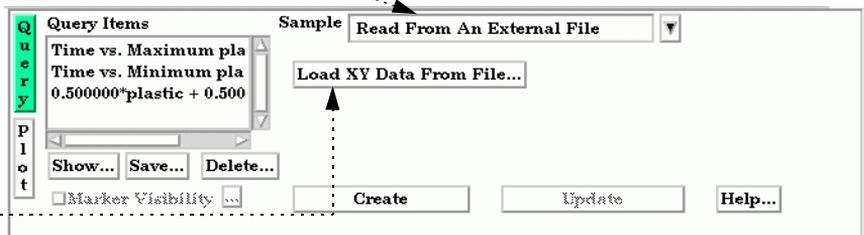
Queries From External Sources

You can import previously created and saved (or externally generated) EnSight queries or Dytran time history (.ths) files.

Read From An External File

1. Select Sample as "Read From An External File".

2. Click the "Load XY Data From File ..." button to open the File Selection dialog, and select any previously saved EnSight XY data file or a Dytran .ths file.





Plotting

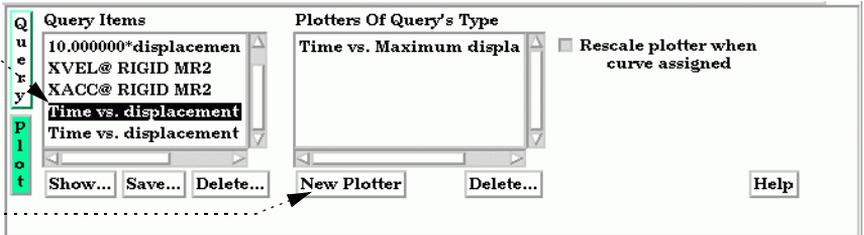
Once Queries exist, they can be easily plotted in a new plotter in EnSight, or if an existing plotter of the correct type exists, they can be added to the existing plotter.

1. Select the Query Item to be plotted.

2. Click the New Plotter button if a new plotter is desired.

In this case we did not choose to plot the node query at Node 100 on the Maximum plot.

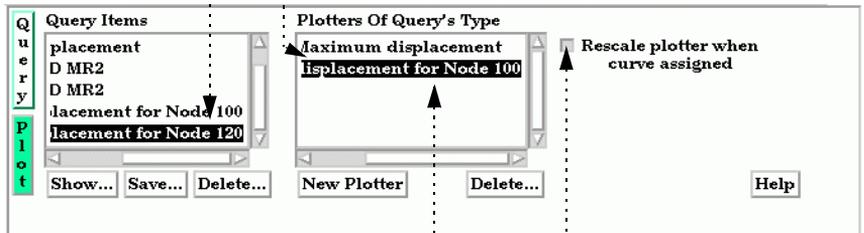
Instead we created a new plotter.



3. Select the next Query Item to be plotted.

4. Select the existing plotter on which to add this query plot.

In this case, the node query at Node 120 is added to the plot for Node 100 (which we just created in step 2. above) - thus the plotter will now have two curves on it.



Note: the toggle indicated controls whether the plot is automatically rescaled whenever a curve is assigned to it, or not.

OTHER NOTES

See [XY Plot Data Format](#) in the User Manual for a description of the plot file format.

SEE ALSO

[How To Probe Interactively](#)
[How To Change Plot Attributes](#)

User Manual: [Query/Plot](#)