



INTRODUCTION

Part attributes control the appearance and behavior of parts. Much of the power of EnSight derives from the broad range of attributes available and the ease with which they can be changed. Attributes are grouped into three classes:

Creation	Creation attributes are unique for each (non-model) part type (e.g. the isovalue of an isosurface). Most (if not all) of the creation attributes for a part are accessible in the Quick Interaction area after double-clicking the part in the Main Parts List, or by the main menu structure Edit->Part Feature Detail Editors->Model Parts.
General	Visibility Susceptibility to auxiliary clipping Reference Frame Response to change in time (active or frozen) Symmetry options Viewport visibility Coloration (by variable or constant color) Hidden surface toggle Hidden line toggle Shading type (flat, Gouraud, smooth) Transparency Lighting (diffuse, shininess, highlight intensity)
Node, Element, and Line	Node, line, element visibility toggles Node type (dot, cross, sphere) Node scale (constant or variable) Node detail (for spheres) Node and element label toggle Element-line width Element-line style (solid, dotted, or dot-dash) Element representation on client (full, border, 3D border/2D full, feature angle, bounding box, not loaded) Element shrink factor Polygon reduction factor
Displacement	Displacement variable Displacement scaling factor
IJK Axis Display	IJK Axis visibility IJK Axis scale value

Most (if not all) of the Creation attributes for non-model parts can be edited in the Quick Interaction area by double-clicking on the part in the Main Parts list. Most display attributes (such as color and visibility) can be controlled via the icons in Part mode. If required, the Feature Detail Editor can be opened for complete access to all attributes. See [How To Use the Feature Detail Editors](#) for more information.

Since Creation attributes are specific to each (non-model) part type, they are not covered here. Look in the How To article for the specific part type for details on those particular Creation attributes.

This article is divided into the following sections:

- [Part Mode Attribute Icons](#)
- [General Attributes](#)
- [Node, Element, and Line Attributes](#)
- [Displacement Attributes](#)



BASIC OPERATION

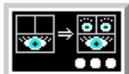
Part Mode Attribute Icons

The Part mode icons can be used to quickly set attributes for parts. To use these controls:

1. Select the desired part(s) in the Main Parts list.
2. Click Part in the Mode Selection area.
3. Click to set the desired attribute:



Part Visibility



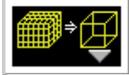
Visibility Per Viewport



Line Width



Opacity / Transparency



Element Visual Representation



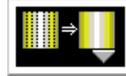
Visual Symmetry



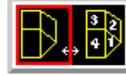
Shaded Surface



Hidden Line



Shading Type



Element Labeling



Node Labeling



Auxiliary Clipping



Node Representation



Fast Display Representation



General Attributes

The General Attributes section in the Feature Detail Editor duplicates many of the controls available in Part mode. To set attributes using the General Attributes section:

1. Select **Edit > Part Feature Detail Editors > part type**.

2. In the parts list at the top of the Feature Detail Editor dialog, select the desired part(s).

By default, any changes you make to attributes will take effect immediately. If you wish to “batch” a series of changes, select **Edit > Immediate Modification** (be sure to use the Edit menu in the Feature Detail Editor dialog) to toggle this setting off. When toggled off, a button at the bottom of the dialog becomes active: **Apply Changes**. Click it when you are ready to apply a set of changes.

3. Set the desired attribute(s):

General Attributes

- Visible** Visible In Viewport(s) Fast Display Rep. Box
- Aux. Clip**
- Active**
- Color By** plastic
- R** 1.00 **G** 1.00 **B** 1.00 Mix...
- Ref. Frame** 0
- Visual Symmetry**
 - Show Original Instance**
 - Type** None
- Surface**
 - Shaded** Shading Gouraud
 - Hidden Line**
 - Opaqueness** 1.00 **Fill Pattern** Fill 0
- Lighting**
 - Diff** 0.10 **Shin** 6.00 **H Int** 0.00

Annotations:

- Toggle part visibility
- Toggle **auxiliary clipping** on/off.
- Toggle whether the client's portion of the part changes if the current time step changes
- Set **color** by constant or color by variable
- Set the part color if constant
- Toggle part hidden surface
- Toggle part hidden line
- Set part **transparency** as “true” or with a fill pattern
- Set part shading parameters:
 - Diff: diffuse shading – the amount of light that a surface reflects. 0 is none and 1 is full.
 - Shin: Degree of shininess – 0 is dull and 100 is very shiny.
 - H Int: Degree of highlight intensity – 0 is none and 1 is full.
- Set part detail representation (according to **Global Viewing Detail Mode**):
 - Box: part is represented as bounding box.
 - Elements: part is represented according to Element Representation
 - Points: part is represented as a point cloud
- Set part **reference frame**
- Set part graphical **symmetry**
- Set shading type:
 - Flat: color and shading are constant across elements
 - Gouraud: color and shading vary linearly across elements
 - Smooth: color and shading calculated based on surface normal interpolated across elements to simulate a smooth surface.

SEE ALSO

[Set Global Viewing Parameters](#)



Node, Element, and Line Attributes

Node, element, and line attributes control how a part's nodes and elements are displayed. Nodes can be displayed as dots, crosses, or spheres. If displayed as crosses or spheres, the radius can be set by the value of a variable at that node. To set attributes using the Node, Element, and Line Attributes section:

1. Select **Edit > Part Feature Detail Editors > part type**.

2. In the parts list at the top of the **Feature Detail Editor** dialog, select the desired part(s).

By default, any changes you make to attributes will take effect immediately. If you wish to "batch" a series of changes, select **Edit > Immediate Modification** (be sure to use the Edit menu in the Feature Detail Editor dialog) to toggle this setting off. When toggled off, a button at the bottom of the dialog becomes active: **Apply Changes**. Click it when you are ready to apply a set of changes.

3. Set the desired attribute(s):

The screenshot shows the 'Node, Element, and Line Attributes' dialog box with the following sections and annotations:

- General Visibility:** Annotations point to checkboxes for 'Node', 'Line', and 'Element' with the text 'Set visibility of nodes, lines, elements'.
- Label Visibility:** Annotations point to checkboxes for 'Node' and 'Element' with the text 'Set node/element label visibility'.
- Node Representation:**
 - 'Type' dropdown is set to 'Dot'. Annotation: 'Set node representation'.
 - 'Scale' field is set to '6.1671e-02'.
 - 'Detail' field is set to '4'.
 - 'Size By' dropdown is set to 'Constant'.
 - 'Variable' field is set to 'plastic'.
- Line Representation:**
 - 'Width' field is set to '1'.
 - 'Style' dropdown is set to 'Solid'. Annotation: 'Set Line width and Style (Solid, Dotted, or Dot-dashed)'.
- Element Representation:**
 - 'Visual Rep.' dropdown is set to '3D border, 2D full'. Annotation: 'Set element representation (described below)'.
 - 'Shrink Factor' field is set to '0.00'. Annotation: 'Set element shrink factor (shrink elements toward the centroid)'.
 - 'Angle' field is set to '10.0'. Annotation: 'Set angle for Feature Angle representation'.
 - 'Reduce Polygons' checkbox is checked, with a value of '2' and a slider between 'less polygons' and 'more polygons'. Annotation: 'Set polygon reduction. Same model, but simpler representation. Trade-off of visual fidelity and rendering speed.'

EnSight provides six representation modes for parts (see also [How To Change Visual Representation](#)):

- Full* Every face and edge of every element is displayed.
- Border* Only unshared faces (for 3D parts) or unshared edges (for 2D parts) are displayed.
- 3D Border, 2D Full* Display 3D parts in Border representation; display 2D parts in Full representation. This is the default representation for all parts.
- Feature Angle* Only those edges joining faces in the Border representation for which the angle between the faces is less than some threshold are displayed. Feature Angle typically extracts the topological features of interest in a model.
- Non Visual* No visual representation exists on the client. It is often useful to use Non Visual as the representation for 3D computational domain parts – provided you also have some sort of shell part to display the outer surface.
- Bounding Box* Displays a bounding box surrounding (and in place of) the nodes and elements.



Displacement Attributes

In structural mechanics simulations, a common output variable is a set of vectors representing the movement or displacement of geometry. Each displacement vector specifies a translation of a node from its original position (an offset). EnSight can display and animate these displacements to help visualize the relative motion of geometry. To set Displacement attributes (see also [How To Display Displacements](#)):

Set Displace By to either None (no displacement) or the vector variable to use for displacement.

Displacement Attributes

Displace By

Factor

Set nodal displacement factor to reduce or exaggerate a displacement

IJK Axis Display Attributes

Model Parts and clips (because they can be structured parts) will have these attributes available. These attributes will only be applicable to structured parts.

Toggle IJK Axis Visible to display an IJK axis for the part.

IJK Axis Display Attributes

IJK Axis Visible Scale

The scale factor for the IJK Axis triad can be modified in this field.

SEE ALSO

[Introduction to Part Creation](#)

User Manual: [Part Attributes](#)