# Major Sections

<table>
<thead>
<tr>
<th>Major Sections</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>Other commands</td>
<td>20</td>
</tr>
<tr>
<td>anim_flipbook</td>
<td>21</td>
</tr>
<tr>
<td>anim_keyframe</td>
<td>59</td>
</tr>
<tr>
<td>anim_quick</td>
<td>101</td>
</tr>
<tr>
<td>anim_recorders</td>
<td>115</td>
</tr>
<tr>
<td>anim_screens</td>
<td>119</td>
</tr>
<tr>
<td>anim_traces</td>
<td>123</td>
</tr>
<tr>
<td>annot_entlbl</td>
<td>141</td>
</tr>
<tr>
<td>annotation</td>
<td>149</td>
</tr>
<tr>
<td>boundarylayer</td>
<td>159</td>
</tr>
<tr>
<td>case</td>
<td>171</td>
</tr>
<tr>
<td>clip</td>
<td>181</td>
</tr>
<tr>
<td>command</td>
<td>221</td>
</tr>
<tr>
<td>connect</td>
<td>225</td>
</tr>
<tr>
<td>contour</td>
<td>235</td>
</tr>
<tr>
<td>curve</td>
<td>255</td>
</tr>
<tr>
<td>data</td>
<td>275</td>
</tr>
<tr>
<td>data_partbuild</td>
<td>293</td>
</tr>
<tr>
<td>devsrf</td>
<td>321</td>
</tr>
<tr>
<td>elevsurf</td>
<td>331</td>
</tr>
<tr>
<td>file</td>
<td>341</td>
</tr>
<tr>
<td>format</td>
<td>379</td>
</tr>
<tr>
<td>frame</td>
<td>381</td>
</tr>
<tr>
<td>function</td>
<td>407</td>
</tr>
<tr>
<td>isos</td>
<td>427</td>
</tr>
<tr>
<td>legend</td>
<td>441</td>
</tr>
<tr>
<td>line</td>
<td>457</td>
</tr>
<tr>
<td>logo</td>
<td>469</td>
</tr>
<tr>
<td>material</td>
<td>479</td>
</tr>
<tr>
<td>message-window</td>
<td>487</td>
</tr>
<tr>
<td>model</td>
<td>491</td>
</tr>
<tr>
<td>part</td>
<td>497</td>
</tr>
<tr>
<td>plot</td>
<td>567</td>
</tr>
<tr>
<td>prefs</td>
<td>613</td>
</tr>
<tr>
<td>profile</td>
<td>643</td>
</tr>
<tr>
<td>ptrace</td>
<td>653</td>
</tr>
<tr>
<td>query_ent_var</td>
<td>729</td>
</tr>
<tr>
<td>query_interact</td>
<td>765</td>
</tr>
<tr>
<td>savegeom</td>
<td>781</td>
</tr>
<tr>
<td>seppatch</td>
<td>795</td>
</tr>
<tr>
<td>shell</td>
<td>809</td>
</tr>
<tr>
<td>shock</td>
<td>811</td>
</tr>
<tr>
<td>show_info</td>
<td>833</td>
</tr>
<tr>
<td>solution_time</td>
<td>841</td>
</tr>
<tr>
<td>subset</td>
<td>859</td>
</tr>
<tr>
<td>tensor</td>
<td>865</td>
</tr>
<tr>
<td>text</td>
<td>889</td>
</tr>
<tr>
<td>tools</td>
<td>905</td>
</tr>
<tr>
<td>varextcfd</td>
<td>911</td>
</tr>
<tr>
<td>variables</td>
<td>923</td>
</tr>
<tr>
<td>vctarrow</td>
<td>933</td>
</tr>
<tr>
<td>view</td>
<td>951</td>
</tr>
<tr>
<td>view_transf</td>
<td>965</td>
</tr>
<tr>
<td>viewport</td>
<td>1023</td>
</tr>
<tr>
<td>viewport_bounds</td>
<td>1049</td>
</tr>
<tr>
<td>vortexcore</td>
<td>1075</td>
</tr>
</tbody>
</table>
Table of Contents

Major Sections
Introduction

Purpose

The purpose of this manual is to document the usage and syntax of EnSight's command language in order to assist users interested in modifying and, in some circumstances, writing command files. The manual is organized alphabetically by command. Each command is documented in terms of syntax followed by any applicable notes and an example.

This manual is not intended for users not well acquainted with EnSight. The manual does not contain a thorough description of functionality, philosophies, usage, etc. and should be used in close reference to the EnSight User Manual for Version 7.6 and EnSight How To Manual. To aid in this, each command is cross referenced back to the section index which in turn references appropriate sections in EnSight’s User and How To manuals.

Warning

*EnSight’s command language is really a journaling language. It is NOT intended to be generated externally to the software. Accordingly, users are encouraged to modify existing command files with care and discouraged from writing all but the simplest files from scratch.*

*Since the language is intended for journaling, EnSight's command interpreter is very unforgiving. While command syntax is checked by the interpreter the appropriateness of the command is not. The user can, for example, issue commands to select a clip part and modify the parts isosurface value. The result of inappropriate commands can be program termination.*

Compatibility

The current form of EnSight’s command language was first introduced in the 5.0 release in 1993. Previous to this a non user readable language existed back to the first release in 1989.

The command language introduced in 1993 has remained largely compatible through each new release. In the cases that the command language is changed great effort is taken to handle backward compatibility within EnSight’s command interpreter. EnSight’s release notes (found on the top directory of the release CD and as a pdf document under the doc directory) document any command language incompatibilities that might exist with previous releases. This chapter also contains an Incompatibility Section which describes command language incompatibilities starting with EnSight 7.4.

Organization and Notation

Each documented command begins on a new page with the name of the command as the page header. The command is first described together with it’s arguments. The arguments to the command are shown within <>’s. For example:

```
plot: axis_x_origin <origin>
```

indicates that the command must be issued as "plot: axis_x_origin" followed by a single argument called "origin".

Each argument is shown in the Parameter section which describes the argument type and purpose.
**Introduction**

Argument types are as follows:

<table>
<thead>
<tr>
<th>Argument Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>An integral value, i.e., values do not contain decimal places. For example, -10, 0, 123</td>
</tr>
<tr>
<td>float</td>
<td>Any numeric input which may or may not contain a decimal or exponent. For example, 10.2, -123, 1.e3</td>
</tr>
<tr>
<td>string</td>
<td>Any combination of printable characters. For example, Pressure, /tmp/myfilename</td>
</tr>
<tr>
<td>constant</td>
<td>Indicates that the argument must be a character string as documented. For example, ON, OFF, mesh</td>
</tr>
</tbody>
</table>

**Required**

Any command file (or macro file) read by EnSight must begin with the following line:

```plaintext
VERSION x.xx
```

where x.xx is the version for the command language. In all cases the version number corresponds to the version of EnSight in use. For example, “VERSION 7.01”

The version number is used by the command interpreter so that any language incompatibilities may be taken into account.

**Examples**

Three complete examples are shown below. The first and third examples use data from the “data” directory of the EnSight release CD, while the second example uses data from the “other_data” directory.

**Example 1**

```plaintext
VERSION 7.40
prefs: icon_help_labels OFF
prefs: auto_legend_replace ON
prefs: tool_tips OFF
prefs: plane_tool_type line
prefs: view_mode_allowed OFF
prefs: frame_mode_allowed OFF
#
# Above: The version number is required. Preferences are optional.
# Below: Read unstructured external flow dataset.
# data: binary_files_are big_endian
data: format case
data: path /scratch/data/ensight76/data/ami
data: geometry ami.case
data: read
data_partbuild: begin
#
# Load/build external 3D flow field part
# to exist but not be visual on client.
# part: select_default
part: modify_begin
```

```plaintext

```
part: elt_representation not_loaded
part: modify_end
data_partbuild: data_type unstructured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: description
data_partbuild: create
#
# Load/build 2D shell part.
#
part: select_default
part: modify_begin
part: elt_representation 3D_border_2D_full
part: modify_end
data_partbuild: data_type unstructured
data_partbuild: select_begin
  2
data_partbuild: select_end
data_partbuild: description
data_partbuild: create
data_partbuild: end
#
# Turn on shading
#
view: hidden_surface ON
#
# Activate pressure variable, and
# Color 2D part by pressure.
#
variables: activate pressure
part: select_begin
  2
part: select_end
part: modify_begin
part: colorby_palette pressure
part: modify_end
#
# Transform (rotate, zoom, translate) part globally.
#
view_transf: rotate -74.198471 -3.497139 0.000000
view_transf: function global
view_transf: rotate 27.206108 67.268570 0.000000
view_transf: function global
view_transf: zoom 0.519211
view_transf: function global
view_transf: zoom 0.681123
view_transf: function global
view_transf: translate 0.058393 2.262181 0.000000
view_transf: function global
view_transf: rotate -5.770993 2.262856 0.000000
view_transf: function global
view_transf: zoom 1.208323
view_transf: function global
view_transf: translate -2.160550 -1.404112 0.000000
view_transf: function global
#
# Toggle-on pressure legend.
#
legend: select_palette_begin
pressure
legend: select_palette_end
legend: visible ON
#
# Create iso-surface part from pressure on 3D part.
#
part: select_begin
  1
part: select_end
isos: begin
isos: variable pressure
isos: value 1.0000e+00
isos: type isosurface
isos: end
isos: create
part: select_begin
  3
part: select_end
#
# Modify iso-surface value.
#
part: select_begin
  3
part: select_end
part: modify_begin
isos: value 9.5334e-01
part: modify_end
#
# Color iso-surface part.
#
part: select_begin
  3
part: select_end
part: modify_begin
part: colorby_palette pressure
part: modify_end
#
# Color iso-part by velocity.
# (First need to activate the velocity variable.)
#
variables: activate velocity
part: select_begin
  3
part: select_end
part: modify_begin
part: colorby_palette velocity
part: modify_end
#
# Create text annotating the current iso-value of the iso-part.
#
legend: select_default
view_transf: function global
text: new_text Iso-value = <\pval "%.2f" 3\>
text: select_begin
  0
text: select_end
#
# Modify location of text annotation string.
#
text: select_begin
Modify legend location attributes.

Modify pressure palette.

Delete (currently selected) iso-part.

Delete corresponding iso-annotation.

Modify pressure palette.
function: scale linear
function: limit_fringes no
function: display_undefined by_model_color
function: # of levels 5
function: edit_level 1
function: value 8.0982e-01
function: edit_level 2
function: value 8.7701e-01
function: edit_level 3
function: value 9.4421e-01
function: edit_level 4
function: value 1.0114e+00
function: edit_level 5
function: value 1.0786e+00
function: edit_level 1
function: RGB 0.0000e+00 0.0000e+00 1.0000e+00
function: edit_level 2
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 4
function: RGB 1.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
#
# Add another level to the pressure palette.
#
function: modify_begin
function: # of levels 6
function: edit_level 2
function: value 8.6357e-01
function: edit_level 3
function: value 9.1733e-01
function: edit_level 4
function: value 9.7109e-01
function: edit_level 5
function: value 1.0248e+00
function: edit_level 6
function: value 1.0786e+00
function: edit_level 2
function: RGB 0.0000e+00 8.0000e-01 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 4.0000e-01
function: edit_level 4
function: RGB 4.0000e-01 1.0000e+00 0.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 8.0000e-01 0.0000e+00
function: edit_level 6
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
#
# Toggle-off legend.
#
legend: select_palette_begin
pressure
legend: select_palette_end
legend: visible OFF
#
# Create 2D-clip x-plane part.
Example 2

VERSION 7.40
prefs: icon_help_labels OFF
prefs: auto_legend_replace ON
prefs: tool_tips OFF
prefs: plane_tool_type line
prefs: view_mode_allowed OFF
prefs: frame_mode_allowed ON
command: part_selection_by number
# 
# Above: Required version number followed by optional preferences.
# 
# Below: Read transient unstructured dataset.
#   (A structures application, dropping a cylinder on a rail.)
# 
data: binary_files_are big_endian
data: format case
data: path /scratch/data/ensight76/other_data/ensight/dyna
data: geometry dyna.case
data: start_time 16
data: read
data_partbuild: begin
# # Load/build both 2D parts
# (cylinder-collar part and rail part)
# data_partbuild: data_type unstructured
data_partbuild: select_all
data_partbuild: description
data_partbuild: create
data_partbuild: end
# # Shade parts (default part color).
# view: hidden_surface ON
# # Color parts by Stress.
# variables: activate Stress
part: select_all
part: modify_begin
part: colorby_palette Stress
part: modify_end
#
# Displace parts by the displacement variable.
# variables: activate Displacement
part: select_all
part: modify_begin
part: displace_by Displacement
part: modify_end
#
# Transform parts.
# view_transf: rotate 12.091602 -32.914276 0.000000
view_transf: function global
view_transf: zoom 0.751079
view_transf: function global
view_transf: translate -0.014558 1.264062 0.000000
view_transf: function global
#
# Change time step.
# solution_time: current_step 1.0000e+01
solution_time: update_to_current
#
# Return to final time step.
# solution_time: current_step 1.6000e+01
solution_time: update_to_current
#
# Load/play transient flipbook.
# anim_flipbook: begin_time_step 0
anim_flipbook: end_time_step 16
anim_flipbook: specify_time_as step
anim_flipbook: load
anim_flipbook: run_type auto
#
# Step thru flipbook page-by-page.
anim_flipbook: run_type step
anim_flipbook: page 1.000000
anim_flipbook: page 2.000000
anim_flipbook: page 3.000000
anim_flipbook: page 4.000000
anim_flipbook: page 5.000000
anim_flipbook: page 6.000000
anim_flipbook: page 7.000000
anim_flipbook: page 8.000000
anim_flipbook: page 9.000000
anim_flipbook: page 10.000000
anim_flipbook: page 11.000000
anim_flipbook: page 12.000000
anim_flipbook: page 13.000000
anim_flipbook: page 14.000000
anim_flipbook: page 15.000000
anim_flipbook: page 16.000000
anim_flipbook: page 0.000000

# Modify flipbook settings.
# anim_flipbook: display_speed 0.500000
anim_flipbook: run_type auto

# Sync flipbook with keyframe animation.
# (Keyframe using the loaded flipbook objects.)
# anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_screens: type full
anim_keyframe: run

# Delete flipbook.
# anim_flipbook: delete_all_pages

# Keyframe w/transient data using same settings.
# (Keyframe by loading each transient time step.)
# anim_keyframe: use_transient_data ON
anim_keyframe: run

# Delete keyframe animation segment.
# anim_keyframe: keyframing OFF

# Query maximum stress over time.
# query_ent_var: modify_begin
query_ent_var: variable_y Stress
query_ent_var: variable_x TIME
query_ent_var: modify_end
part: select_begin
  1
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type generated
Introduction

query_ent_var: #_of_sample_pts 17
query_ent_var: begin_simtime 0.0000e+00
query_ent_var: end_simtime 1.6000e+01
query_ent_var: constrain max
query_ent_var: sample_by value
query_ent_var: variable_y Stress
query_ent_var: generate_over time
query_ent_var: variable_x TIME
query_ent_var: end
query_ent_var: query
curve: select_begin
  0
curve: select_end
  #  # Plot maximum stress over time.
# curve: assign rescale Time vs. Maximum Stress
plot: select_begin
  0
plot: select_end
  #  # Modify plot settings (size and add grid).
# view_transf: function global
plot: origin_x 0.0000e+00
plot: width 4.6849e-01
plot: height 5.3018e-01
plot: axis_x_gridtype grid
plot: axis_y_gridtype grid
view_transf: function global
#  # Save image.
# file: image_file image1
file: save_image

Example 3

VERSION 7.40
prefs: icon_help_labels OFF
prefs: auto_legend_replace ON
prefs: tool_tips OFF
prefs: plane_tool_type line
prefs: view_mode_allowed OFF
prefs: frame_mode_allowed OFF
command: part_selection_by number
#  # Above: Required version number followed by optional preferences.
# Below: Read PLOT3D structured dataset
# data: binary_files_are big_endian
data: format plot3d
data: plot3diblank OFF
data: plot3dmulti_zone OFF
data: plot3dread_as c_binary
data: plot3ddimension 3d
data: path /scratch/data/ensight76/data/plot3d
data: geometry shuttle.grid
data: result shuttle.q
data_partbuild: begin
data: read
#
# Specify external 3D flow field around shuttle
# to load only on the server and not visible on the client.
#
part: select_default
part: modify_begin
part: elt_representation not_loaded
part: modify_end
#
# Load/build external 3D flow field around shuttle.
#
data_partbuild: data_type structured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 80
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 45
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description flow field
data_partbuild: create
#
# Specify 2D shell part of shuttle
# to load on server and visible on client.
#
part: select_default
part: modify_begin
part: elt_representation 3D_border_2D_full
part: modify_end
#
# Load/build 2D shell part of shuttle.
#
data_partbuild: data_type structured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 52
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 1
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description shuttle
data_partbuild: create
data_partbuild: end
#
# Turn on shading
#
view: hidden_surface ON
#
# Transform shuttle part into a forward facing view.
#
view_transf: rotate -81.618317 -3.497139 0.000000
view_transf: function global
view_transf: rotate 2.473281 115.199997 0.000000
view_transf: function global
view_transf: rotate 21.709923 4.525713 0.000000
view_transf: function global
view_transf: zoom 0.779425
view_transf: function global
view_transf: zoom 0.799537
view_transf: function global
view_transf: zoom 0.904418
view_transf: function global
view_transf: translate -0.191782 -0.017080 0.000000
view_transf: function global
#
# Apply visual symmetry to shuttle part.
#
part: select_begin
  2
part: select_end
part: modify_begin
part: mirror_y ON
part: modify_end
#
# Compute area of shuttle part.
#
part: select_begin
  2
part: select_end
variables: evaluate Area = Area(plist)
#
# Enable extended CFD variables list.
#
varextcfd: modify_begin
varextcfd: freestream_mach 3.0000e-01
varextcfd: modify_end
varextcfd: show_extended ON
#
# Color shuttle part by velocity
# (which first activates velocity prior to coloring).
#
variables: activate Velocity
part: select_begin
  2
part: select_end
part: modify_begin
part: colorby_palette Velocity
part: modify_end
#
# Set cursor location for particle trace.
#
view: pick_mode cursor
view_transf: cursor 0.179618 0.084309 0.007263
tools: cursor ON
view_transf: function cursor
view_transf: translate 0.008001 0.033193 -0.027716
view_transf: function global
#
# Create a streamline emitted from the cursor.
#
ptrace: select_default
part: modify_begin
ptrace: variable Velocity
part: modify_end
part: select_begin
1
part: select_end
ptrace: create_pt
part: select_begin
3
part: select_end
#
# Apply visual symmetry to streamline part.
#
part: modify_begin
part: mirror_y ON
part: modify_end
#
# Animate streamline.
#
part: modify_begin
ptrace: animate ON
part: modify_end
#
# Toggle-off visibility of streamline part
# to help see animated tracers better.
#
part: modify_begin
part: visible OFF
part: modify_end
#
# Add multiple pulses and represent tracer head as sphere.
#
anim_traces: multiple_pulses ON
anim_traces: head_type sphere
#
# Size head of tracer by velocity.
#
anim_traces: head_size_by vector_mag
anim_traces: head_variable Momentum
anim_traces: head_variable Momentum
anim_traces: head_variable Velocity
anim_traces: head_variable Velocity
#
# Color tracers by velocity.
#
part: modify_begin
part: colorby_palette Velocity
part: modify_end
#
# Toggle-off cursor tool.
#
tools: cursor OFF
#
# Color shuttle by pressure.
#
variables: activate Pres
part: select_begin
2
part: select_end
part: modify_begin
part: colorby_palette Pres
part: modify_end
#
# Toggle-on pressure legend.
legend: select_palette_begin
Pres
legend: select_palette_end
legend: visible ON

# Toggle-off animated traces.
part: select_begin
3
part: select_end
part: modify_begin
ptrace: animate OFF
part: modify_end

# Redisplay streamline part, and color them white.
part: modify_begin
part: visible ON
part: colorby_palette none
part: colorby_rgb 1.0000e+00 1.0000e+00 1.0000e+00
part: modify_end

# Save a JPEG image to file “image1”.
file: image_format jpeg
file: image_file image1
file: save_image

Portability

Command language is portable between computer architectures. This is also true between UNIX and Windows except for differences in file pathname conventions between the two systems, i.e., a filename under UNIX might be /mysystem/scratch/tmp/xyz.geo while under windows the file system might be mounted on the G drive such that the file would be G:\tmp\xyz.geo.

Nearly all command files will at some point need to select one or more parts for subsequent operation. By default this is done by part number. For example, the following selects parts 1, 2, and 3 and makes them invisible:

part: select_begin
1 2 3
part: select_end
part: modify_begin
part: visible OFF
part: modify_end

Using part numbers, however, decreases portability since future data files that could take advantage of an existing command file might not contain the same number of parts. To eliminate this problem consider using part selection by name (you can also set this up to be the default recording behavior in EnSight by going to Edit->Preferences->General User Interface and changing from Number to Name). The above example would be equivalent to:

part: select_partname_begin
"(CASE:Case 1) 3d space frame"
"(CASE:Case 1) green arrow"
"(CASE:Case 1) blue arrow"
part: select_partname_end
part: modify_begin
part: visible OFF
part: modify_end

While this produces a larger, more verbose command file it will be more portable.

**Begin/End Constructs**

All commands which modify attributes prior to part creation, a part’s default attributes, or modify an existing part must be bracketed by a begin/end construct. If an existing part is being modified or the default attribute is being changed a “part: modify_begin”, “part: modify_end” pair is used. When used prior to part creation a “xxxx: begin”, “xxxx: end” is used, where xxxx is the name of the part type (for example “clip: begin”). The two examples below are actually equivalent. The first modifies the default attributes for clips and then creates a part while the second example creates the clip directly without modifying the clip defaults.

**Example 1**

```
#
# modify the default attributes for clips
#
clip: select_default
part: modify_begin
clip: tool xyz
clip: mesh_plane X
clip: value 2.0
part: modify_end
#
# select the parent parts
#
part: select_begin
1 2 3 4
part: select_end
clip: create
```

**Example 2**

```
#
# select the parent parts
#
part: select_begin
1 2 3 4
part: select_end
clip: begin
clip: tool xyz
clip: mesh_plane X
clip: value 2.0
clip: end
clip: create
```
Other commands

The three commands below are not documented elsewhere in this manual but can prove useful for debugging purposes.

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>interrupt:</td>
<td>Stops the playback of a command file. (It can be continued from the GUI)</td>
</tr>
<tr>
<td>play: filename</td>
<td>Plays the command file indicated by filename</td>
</tr>
<tr>
<td>exit:</td>
<td>Terminates the program</td>
</tr>
</tbody>
</table>

There are also a number of test commands which may be executed by EnSight. To learn more about these type the command “test: list” in EnSight’s command dialog.

Incompatibilities

In the future this section may contain discussions on incompatibilities between the command language defined in EnSight 7.4 and the then current release.
Commands in this Section:

**anim_flipbook**

- `anim_flipbook: begin_simtime <time_value>`
- `anim_flipbook: begin_time_step <step_value>`
- `anim_flipbook: cycle <toggle>`
- `anim_flipbook: delete_all_pages`
- `anim_flipbook: display_speed <speed_value>`
- `anim_flipbook: dynamic_line <part> <end> <X0> <Y0> <Z0> <Xn> <Yn> <Zn>`
- `anim_flipbook: dynamic_plane <part> <cid> <X0> <Y0> <Z0> <Xn> <Yn> <Zn>`
- `anim_flipbook: dynamic_value <part> <start_value> <end_value>`
- `anim_flipbook: end_simtime <time_value>`
- `anim_flipbook: end_time_step <step_value>`
- `anim_flipbook: interactive_part <option>`
- `anim_flipbook: load`
- `anim_flipbook: load_as <option>`
- `anim_flipbook: load_type <option>`
- `anim_flipbook: move_dynamic_plane <part> <transform> <dx> <dy> <dz>`
- `anim_flipbook: number_to_create <number>`
- `anim_flipbook: page <page_value>`
- `anim_flipbook: regen_all_pages <toggle>`
- `anim_flipbook: run_type <option>`
- `anim_flipbook: save_images <filename_prefix>`
- `anim_flipbook: save_multiple_images <toggle>`
- `anim_flipbook: save_win_size <x_size> <y_size>`
- `anim_flipbook: save_win_type <size>`
- `anim_flipbook: select_all_timesteps`
- `anim_flipbook: show_from_page <page_value>`
- `anim_flipbook: show_to_page <page_value>`
- `anim_flipbook: specify_time_as <option>`
- `anim_flipbook: step_by <step_increment>`
- `anim_flipbook: step_simtime <time_value>`
- `anim_flipbook: time <time_value>`

**See Also:**

- User Manual - Section 7.14, Flipbook Animation
- How To Create a Flipbook Animation
- How To Animate Transient Data
anim_flipbook: begin_simtime

Command:

anim_flipbook: begin_simtime <time_value>

Purpose:

Specify a beginning simulation time value to start the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>beginning simulation time value (which must correspond to the same simulation time at a time step)</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if dataset is not transient.

*Used only if* "anim_flipbook: specify_time_as simulation" *has been specified.*

Example Usage:

```plaintext
# Specify a transient_data flipbook
#
anim_flipbook: load_type transient_data
#
# Set begin/end solution timestep values
#
solution_time: show_as time
#
# Set begin/end flipbook time info
#
anim_flipbook: step_simtime 1.0000e+00
anim_flipbook: specify_time_as simulation
anim_flipbook: begin_simtime 3.4900e+02
anim_flipbook: end_simtime 3.6900e+02
#
# Load flipbook
#
anim_flipbook: load
#
# Run loaded flipbook
#
anim_flipbook: run_type auto
```

See Also:

Associated `anim_flipbook` commands
**anim_flipbook: begin_time_step**

**Command:**

```
anim_flipbook: begin_time_step <step_value>
```

**Purpose:**

Specify a beginning time step value to start the flipbook animation.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_value</td>
<td>beginning time step value in the range of 0 to n - 1, where n = total # of time steps</td>
</tr>
</tbody>
</table>

**Notes:**

Not applicable if dataset is not transient. Used only if “anim_flipbook: specify_time_as step” has been specified.

**Example Usage:**

```
# Specify a transient_data flipbook
#
anim_flipbook: load_type transient_data
#
# Set begin/end solution timestep values
#
solution_time: begin_step 30
solution_time: end_step 50
solution_time: show_as step
#
# Set begin/end flipbook time info
#
# Note: both step and simtime commands are reset because solution time commands were set above
#
anim_flipbook: specify_time_as step
anim_flipbook: step_by 1.0000e+00
anim_flipbook: begin_time_step 30
anim_flipbook: end_time_step 50
#
# Load flipbook
#
anim_flipbook: load
#
# Run loaded flipbook
#
anim_flipbook: run_type auto
```

**See Also:**

Associated anim_flipbook commands
anim_flipbook: cycle

Command:

    anim_flipbook: cycle <toggle>

Purpose:

    Specify the automatic playback sequence of the flipbook.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON alternate playing the flipbook forward and backward</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF (default) always replay the flipbook from beginning to end</td>
</tr>
</tbody>
</table>

Notes:

    Not applicable if flipbook has not been loaded.

Example Usage:

    anim_flipbook: cycle ON

See Also:

    Associated anim_flipbook commands
anim_flipbook: delete_all_pages

Command:

anim_flipbook: delete_all_pages

Purpose:

Specify to delete the currently loaded flipbook.

Parameters:

None.

Notes:

Not applicable if flipbook has not been loaded.

Example Usage:

anim_flipbook: delete_all_pages

See Also:

Associated anim_flipbook commands
anim_flipbook: display_speed

Command:

    anim_flipbook: display_speed <speed_value>

Purpose:

Specifies the playback-speed factor, or the display speed at which the flipbook animates.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>speed_value</td>
<td>set the display speed value in the range [0.,1.] where 1. is the fastest speed (of your hardware) and 0. is stopped (a still page)</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if flipbook has not been loaded.

Example Usage:

    #
    # Halve the display speed
    #
    anim_flipbook: display_speed 0.500000

See Also:

Associated anim_flipbook commands
Command:

```anim_flipbook: dynamic_line <part> <end> <X0> <Y0> <Z0> <Xn> <Yn> <Zn>```

Purpose:

Specify dynamic flipbook animation of the selected 1d-clip line part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part</td>
<td>a valid GUI part number, for a line clip</td>
</tr>
<tr>
<td>int</td>
<td>end</td>
<td>1 - beginning line position</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 - ending line position</td>
</tr>
<tr>
<td>float</td>
<td>X0</td>
<td>X coordinate of first end point of specified line position</td>
</tr>
<tr>
<td></td>
<td>Y0</td>
<td>Y coordinate of first end point of specified line position</td>
</tr>
<tr>
<td></td>
<td>Z0</td>
<td>Z coordinate of first end point of specified line position</td>
</tr>
<tr>
<td></td>
<td>Xn</td>
<td>Y coordinate of second end point of specified line position</td>
</tr>
<tr>
<td></td>
<td>Yn</td>
<td>X coordinate of second end point of specified line position</td>
</tr>
<tr>
<td></td>
<td>Zn</td>
<td>Z coordinate of second end point of specified line position</td>
</tr>
</tbody>
</table>

Notes:

Only used for flipbook animations of interactive clip line parts.

Must be bracketed by "anim_flipbook: interactive_part start" and "anim_flipbook: interactive_part end".

Example Usage:

```# Create the line clip part from the parent field #
part: select_all
clip: begin
clip: domain intersect
clip: tool line
clip: line 1 5.8348e-01 1.3165e+00 1.2670e+00
clip: line 2 3.0835e+00 1.3165e+00 1.2670e+00
clip: end
clip: create
part: select_begin
  2
part: select_end
#
# Load and animate the clip-line part # between the 1st and 2nd dynamic_line positions. #
anim_flipbook: interactive_part start
tools: line ON
part: select_begin
  2
part: select_end
view_transf: function line
view_transf: translate 1.33481 0.816460 0.266963
view_transf: function global```
**anim_flipbook: dynamic_line**

```plaintext
anim_flipbook: dynamic_line 2 1 -0.750000 0.500000 1.000000 0.583581 1.316460 1.266963
anim_flipbook: dynamic_line 2 2 1.750000 0.500000 1.000000 3.083481 1.316460 1.266963
anim_flipbook: interactive_part stop
anim_flipbook: number_to_create 10
anim_flipbook: load
anim_flipbook: run_type auto
tools: line OFF
```

**See Also:**

Associated [anim_flipbook commands](#)
Command:

```plaintext
anim_flipbook: dynamic_plane <part> <cid> <X0> <Y0> <Z0> <Xn> <Yn> <Zn>
```

Purpose:

Specify dynamic flipbook animation of the selected 2d-clip plane part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part</td>
<td>GUI part number of the 2D-clip plane part to be animated</td>
</tr>
<tr>
<td></td>
<td>cid</td>
<td>corner id (1, 2, 3, or 4) of the plane tool</td>
</tr>
<tr>
<td>float</td>
<td>XO</td>
<td>initial x coordinate of the specified corner of the plane</td>
</tr>
<tr>
<td></td>
<td>YO</td>
<td>initial y coordinate of the specified corner of the plane</td>
</tr>
<tr>
<td></td>
<td>ZO</td>
<td>initial z coordinate of the specified corner of the plane</td>
</tr>
<tr>
<td></td>
<td>Xn</td>
<td>final x coordinate of the specified corner of the plane</td>
</tr>
<tr>
<td></td>
<td>Yn</td>
<td>final y coordinate of the specified corner of the plane</td>
</tr>
<tr>
<td></td>
<td>Zn</td>
<td>final z coordinate of the specified corner of the plane</td>
</tr>
</tbody>
</table>

Notes:

Used for flipbook animations of interactive isosurface, ijk-clip, and xyz-clip parts. Only applicable between commands:

```plaintext
anim_flipbook: interactive_part start
anim_flipbook: interactive_part stop
```

Example Usage:

```plaintext
# From the flow field part (number 1),
# create the 2D-clip plane part (number 2)
# and color it by temperature.
#
part: select_begin
  1
part: select_begin
part: modify_begin
part: colorby_palette temperature
part: modify_end
#
# Specify interactive flipbook animation
# of the 2D-clip part.
#
anim_flipbook: interactive_part start
tools: plane line
```
anim_flipbook: dynamic_plane

view_transf: function plane
view_transf: action translate
view_transf: translate 0.0000e+00 0.0000e+00 1.0000e+00
part: select_begin
  2
part: select_end
part: modify_begin
clip: plane 1 -7.5000e-01 -7.5000e-01 2.0000e+00
clip: plane 2 1.7500e+00 -7.5000e-01 2.0000e+00
clip: plane 3 1.7500e+00 1.7500e+00 2.0000e+00
part: modify_end
tools: plane line
tools: plane line
view_transf: function global
view_transf: function global

# # Track the dynamic position of the four corners # of the clip plane tool.
# anim_flipbook: dynamic_plane 2 1 -0.750000 -0.750000 1.000000 -0.750000
# -0.750000 2.000000
anim_flipbook: dynamic_plane 2 2 1.750000 -0.750000 1.000000 1.750000 -0.750000 2.000000
anim_flipbook: dynamic_plane 2 3 1.750000 1.750000 1.000000 1.750000
1.750000 2.000000
anim_flipbook: dynamic_plane 2 4 -0.750000 1.750000 1.000000 -0.750000
1.750000 2.000000
anim_flipbook: move_dynamic_plane 2 5 0.000000 0.000000 1.000000
anim_flipbook: interactive_part stop
#
anim_flipbook: number_to_create 10
anim_flipbook: load
tools: plane OFF
anim_flipbook: run_type auto
anim_flipbook: run_type off

See Also:

Associated anim_flipbook commands
anim_flipbook: dynamic_value

Command:

```plaintext
anim_flipbook: dynamic_value <part> <start_value> <end_value>
```

Purpose:

Specify dynamic flipbook animation of the selected isosurface, xyz-clip, or ijk-clip part, within the appropriate specified dynamic ranges.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part</td>
<td>GUI part number of the part to be animated</td>
</tr>
<tr>
<td>float</td>
<td>start_value</td>
<td>the starting dynamic value of the animation</td>
</tr>
<tr>
<td>float</td>
<td>end_value</td>
<td>final dynamic value of the animation, i.e. the ending isosurface value; x, y, or z clip value; or i, j, or k value of the respective isosurface, xyz clip, or ijk clip part</td>
</tr>
</tbody>
</table>

Notes:

Used for flipbook animations of interactive isosurface, ijk-clip, and xyz-clip parts. Only applicable between commands:

```plaintext
anim_flipbook: interactive_part start
anim_flipbook: interactive_part stop
```

Example Usage:

```plaintext
# (Note: A clip part has already been generated via the XYZ clip part feature and colored by a variable.)
# Update the 2D clip part clip at
# part: select_begin
  2
part: select_end
part: modify_begin
clip: mesh_plane X
clip: tool xyz
clip: value 1.000000
part: modify_end
#
# Specify type of flipbook
#
anim_flipbook: load_type create_data
#
# Setup interactive flipbooking of the clip part number 2 from values 1. to 3.
# anim_flipbook: interactive_part start
part: select_begin
  2
part: select_end
part: modify_begin
clip: value 3.000000
part: modify_end
anim_flipbook: dynamic_value 2 1.000000 3.000000
anim_flipbook: interactive_part stop
#```
# anim_flipbook: dynamic_value

# Load 10 flipbook pages
#
anim_flipbook: number_to_create 10
anim_flipbook: load
#
# Run loaded flipbook pages
#
anim_flipbook: run_type auto

See Also:

Associated `anim_flipbook` commands
anim_flipbook: end_simtime

Command:

`anim_flipbook: end_simtime <time_value>`

Purpose:

Specify an ending simulation time value to start the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>ending simulation time value (which must correspond to the simulation time at a time step)</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if dataset is not transient. An ending simulation time must correspond to the simulation time of a time step.

Used only if `anim_flipbook: specify_time_as step` has been specified.

Example Usage:

```
# Specify a transient_data flipbook
#
anim_flipbook: load_type transient_data
#
# Set begin/end solution timestep values
#
solution_time: begin_step 30
solution_time: end_step 50
solution_time: show_as time
#
# Set begin/end flipbook time info
#
anim_flipbook: step_simtime 1.0000e+00
anim_flipbook: specify_time_as simulation
anim_flipbook: begin_simtime 3.4900e+02
anim_flipbook: end_simtime 3.6900e+02
#
# Load flipbook
#
anim_flipbook: load
#
# Run loaded flipbook
#
anim_flipbook: run_type auto
```

See Also:

Associated `anim_flipbook` commands
anim_flipbook: end_time_step

Command:

anim_flipbook: end_time_step <step_value>

Purpose:

Specify an ending time step value to start the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_value</td>
<td>ending time step value in the range of 0 to n - 1, where n = total # of timesteps</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if dataset is not transient.

Used only if "anim_flipbook: specify_time_as step" has been specified.

Example Usage:

```
# # Specify a transient_data flipbook
# anim_flipbook: load_type transient_data
# # Set begin/end solution timestep values
# solution_time: begin_step 30
solution_time: end_step 50
solution_time: show_as step
#
# Set begin/end flipbook time info
# # Note: both step and simtime commands are reset # because solution time commands were set above
#
anim_flipbook: step_by 1.0000e+00
anim_flipbook: specify_time_as step
anim_flipbook: begin_time_step 30
anim_flipbook: end_time_step 50
#
# Load flipbook
# anim_flipbook: load
#
# Run loaded flipbook
# anim_flipbook: run_type auto
```

See Also:

Associated anim_flipbook commands
Command:

\texttt{anim\_flipbook: interactive\_part <option>}

Purpose:

Specify the start and stop of the recording of interactive movement of any specified isosurface or clip parts during a flipbook load.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td></td>
</tr>
<tr>
<td></td>
<td>start</td>
<td>begin (turn-on) recording of interactive movements of specified parts</td>
</tr>
<tr>
<td></td>
<td>stop</td>
<td>(default) end (turn-off) recording of interactive movement of specified parts</td>
</tr>
</tbody>
</table>

Notes:

Currently this operation only works for interactive manipulation of isosurface and 2D clip parts. Used in conjunction with the following commands:

\begin{verbatim}
part: select_begin
part: select_end
part: modify_begin
part: modify_end
anim_flipbook: dynamic_value
anim_flipbook: dynamic_line
anim_flipbook: dynamic_plane
anim_flipbook: move_dynamic_plane
\end{verbatim}

Example Usage:

\begin{verbatim}
# (Note: A clip part has already been generated via the
#       XYZ clip part feature and colored by a variable.)
#
# Update the 2D clip part clip at
#part: select_begin
#  2
part: select_end
part: modify_begin
clip: mesh_plane X
clip: tool xyz
clip: value 1.000000
part: modify_end
#
# Specify type of flipbook
#anim_flipbook: load_type create_data
#
# Setup interactive flipbooking of the clip part
#anim_flipbook: interactive_part start
part: select_begin
  2
part: select_end
part: modify_begin
\end{verbatim}
anim_flipbook: interactive_part

clip: value 3.000000
part: modify_end
anim_flipbook: dynamic_value 2 1.000000 3.000000
anim_flipbook: interactive_part stop
#  
# Load 10 flipbook pages  
#  
anim_flipbook: number_to_create 10
anim_flipbook: load
#  
# Run loaded flipbook pages  
#  
anim_flipbook: run_type auto

See Also:

Associated anim_flipbook commands
anim_flipbook: load

Command:

```
anim_flipbook: load
```

Purpose:

Specify the loading of the flipbook pages, according to the selected part(s) and specified flipbook options.

Parameters:

None.

Example Usage:

```
#  # Note: transient dataset w/83 time steps...
#  # Specify a transient_data flipbook
#  anim_flipbook: load_type transient_data
#  # Specify page increment
#  anim_flipbook: step_by 1.0000e+01
#  # Set begin/end flipbook time info
#  anim_flipbook: begin_time_step 0
#  anim_flipbook: end_time_step 83
#  anim_flipbook: specify_time_as step
#  # Load flipbook pages {0,10,20,30,40,50,60,70,80}
#  anim_flipbook: load
#  # Run loaded flipbook
#  anim_flipbook: run_type auto
```

See Also:

Associated `anim_flipbook` commands
anim_flipbook: load_as

Command:

\texttt{anim\_flipbook: load\_as \textless\text{option}\textgreater}

Purpose:

Specify whether to load the flipbook as graphic objects or images.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>graphic_objects (default) record the flipbook animation as a collection of graphic objects which may be transformed while running the flipbook. (Playback performance depends on the visual complexity of the model.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>graphic_images record the flipbook animation as a collection of graphic images which may not be transformed while running the flipbook. (Playback performance depends on window size.)</td>
</tr>
</tbody>
</table>

Notes:

Since \texttt{graphic\_images} record the image on the screen, make sure there is no overlaying dialog or image overlapping the main graphics window.

Example Usage:

\texttt{anim\_flipbook: load\_as graphic\_images}

See Also:

Associated \texttt{anim\_flipbook} commands
anim_flipbook: load_type

Command:

    anim_flipbook: load_type <option>

Purpose:

    Specifies the type of flipbook animation to load.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>transient_data (default) animation changes in coloration and/or shape, resulting from changes in the transient nature of the data</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mode_shapes animation changes in the mode shape of the corresponding part(s), resulting from a displacement variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>create_data animation changes in isosurface and/or clip parts, resulting from their change in values or corresponding movement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>linear_load animation changes in the displacement (vector) variable of corresponding parts, resulting from linear interpolating the displacement field from its zero to maximum value. (The variable values or colors also update according to the linearly displaced values.</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Example of <transient_data>
# Note: transient dataset w/83 time steps...
# Specify a transient_data flipbook
anim_flipbook: load_type transient_data
# Specify page increment
anim_flipbook: step_by 1.0000e+01
# Set begin/end flipbook time info
anim_flipbook: begin_time_step 0
anim_flipbook: end_time_step 83
anim_flipbook: specify_time_as step
# Load flipbook pages {0,10,20,30,40,50,60,70,80}
anim_flipbook: load
# Run loaded flipbook
anim_flipbook: run_type auto
```
# Example of <create_data>
# (Note: A clip part has already been generated via the XYZ clip part feature and colored by a variable.)
# Update the 2D clip part clip at part: select_begin
2
part: select_end
part: modify_begin
clip: mesh_plane X
clip: tool xyz
clip: value 1.000000
part: modify_end
#
# Specify type of flipbook

anim_flipbook: load_type create_data
#
# Setup interactive flipbooking of the clip part
# anim_flipbook: interactive_part start
part: select_begin
2
part: select_end
part: modify_begin
clip: value 3.000000
part: modify_end
anim_flipbook: dynamic_value 2 1.000000 3.000000
anim_flipbook: interactive_part stop
#
# Load 10 flipbook pages
#
anim_flipbook: number_to_create 10
anim_flipbook: load
#
# Run loaded flipbook pages
#
anim_flipbook: run_type auto

#
# Example of <mode_shapes>
#
# Note: Prior to animating modes shapes ... activate and displace displacement vector variable on selected parts.

variables: activate 3D_Displacement
part: select_all
part: modify_begin
part: displace_by 3D_Displacement
part: modify_end
#

anim_flipbook: load_type mode_shapes
anim_flipbook: number_to_create 10
anim_flipbook: load
anim_flipbook: run_type auto

# Followed by example of <linear_load>
# Delete current flipbook
#anim_flipbook: delete_all_pages
# Load and run 10 linear_load flipbook pages
#anim_flipbook: load_type linear_load
anim_flipbook: number_to_create 10
anim_flipbook: load
anim_flipbook: run_type auto

See Also:

Associated anim_flipbook commands
anim_flipbook: move_dynamic_plane

Command:
anim_flipbook: move_dynamic_plane <part> <transform> <dx> <dy> <dz>

Purpose:
Specify the vector in which the 2d-clip plane part is to be transformed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part</td>
<td>GUI part number of the part to be animated</td>
</tr>
</tbody>
</table>
|      | transform | 1 - rotation transformation  
|      |           | 3 - scale transformation  
|      |           | 5 - translation transformation |
| float| dx        | x-component of the direction vector for the transformation to follow |
|      | dy        | y-component of the direction vector for the transformation to follow |
|      | dz        | z-component of the direction vector for the transformation to follow |

Notes:
Only currently applicable for "anim_flipbook: dynamic_plane" commands, i.e. for flipbook animations of interactive clip parts via the plane tool.

Example Usage:

```plaintext
# From the flow field part (number 1),  
# create the 2D-clip plane part (number 2)  
# and color it by temperature.  
# part: select_begin  
1
part: select_begin  
clip: begin  
clip: domain intersect  
clip: tool plane  
clip: plane 1 -7.5000e-01 -7.5000e-01 1.0000e+00  
clip: plane 2 1.7500e+00 -7.5000e-01 1.0000e+00  
clip: plane 3 1.7500e+00 1.7500e+00 1.0000e+00  
clip: end  
clip: create  
part: select_begin  
2
part: select_end  
part: modify_begin  
part: colorby_palette temperature  
part: modify_end  
#  
# Specify interactive flipbook animation  
# of the 2D-clip part.  
#  
anim_flipbook: interactive_part start  
tools: plane line  
view_transf: function plane  
view_transf: action translate  
view_transf: translate 0.0000e+00 0.0000e+00 1.0000e+00  
part: select_begin
```
anim_flipbook: move_dynamic_plane

2
part: select_end
part: modify_begin
clip: plane 1 -7.5000e-01 -7.5000e-01 2.0000e+00
clip: plane 2 1.7500e+00 -7.5000e-01 2.0000e+00
clip: plane 3 1.7500e+00 1.7500e+00 2.0000e+00
part: modify_end
tools: plane line
tools: plane line
view_transf: function global
view_transf: function global
#
# Track the dynamic position of the four corners
# of the clip plane tool.
#
anim_flipbook: dynamic_plane 2 1 -0.750000 -0.750000 1.000000 -0.750000
-0.750000 2.000000
anim_flipbook: dynamic_plane 2 2 1.750000 -0.750000 1.000000 1.7500000 -0.750000
0.750000 2.000000
anim_flipbook: dynamic_plane 2 3 1.750000 1.750000 1.000000 1.750000
1.750000 2.000000
anim_flipbook: dynamic_plane 2 4 -0.750000 1.750000 1.000000 -0.750000
1.750000 2.000000
#
# Indicate the 2d-clip plane's translation
#
anim_flipbook: move_dynamic_plane 2 5 0.000000 0.000000 1.000000
anim_flipbook: interactive_part stop
#
anim_flipbook: number_to_create 10
anim_flipbook: load
tools: plane OFF
anim_flipbook: run_type auto
anim_flipbook: run_type off

See Also:

Associated anim_flipbook commands
anim_flipbook: number_to_create

Command:

\[
\text{anim_flipbook: number_to_create <number>}
\]

Purpose:

Specify the number of pages to create in the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>number</td>
<td>(positive) number of pages to create</td>
</tr>
</tbody>
</table>

Example Usage:

```#
# (Note: A clip part has already been generated via the
#        XYZ clip part feature and colored by a variable.)
#
# Update the 2D clip part clip at
# part: select_begin
  2
part: select_end
part: modify_begin
clip: mesh_plane X
clip: tool xyz
clip: value 1.000000
part: modify_end
#
# Specify type of flipbook
# anim_flipbook: load_type create_data
# Setup interactive flipbooking of the clip part
# anim_flipbook: interactive_part start
part: select_begin
  2
part: select_end
part: modify_begin
clip: value 3.000000
part: modify_end
anim_flipbook: dynamic_value 2 1.000000 3.000000
anim_flipbook: interactive_part stop
#
# Load 10 flipbook pages
# anim_flipbook: number_to_create 10
anim_flipbook: load
#
# Run loaded flipbook pages
# anim_flipbook: run_type auto
```

See Also:

Associated anim_flipbook commands
Command:

```
anim_flipbook: page <page_value>
```

Purpose:

Specify which page of the flipbook animation to display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>page_value</td>
<td>page value of the flipbook animation to display, value must must be given in the appropriate corresponding increment</td>
</tr>
</tbody>
</table>

Notes:

Only applicable with `run_type` set to `step`.

Example Usage:

```
anim_flipbook: run_type step
anim_flipbook: page 1.000000
anim_flipbook: page 2.000000
anim_flipbook: page 3.000000
```

See Also:

Associated `anim_flipbook` commands
anim_flipbook: regen_all_pages

Command:

    anim_flipbook: regen_all_pages <toggle>

Purpose:

Toggle indicating whether to regenerate existing flipbook pages when loading a flipbook.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> (default) create all pages (existing pages are also overwritten)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> existing pages are not replaced by new pages having the same time value, and, if loading transient data, new pages can be interleaved according to their solution-time value</td>
</tr>
</tbody>
</table>

Notes:

No need to regenerate all pages if extending the number of time steps or filling-in skipped time steps.

Example Usage:

    anim_flipbook: regen_all_pages OFF

See Also:

Associated anim_flipbook commands
anim_flipbook: run_type

Command:

anim_flipbook: run_type <option>

Purpose:

Specify how to play the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>auto makes the flipbook play continuously</td>
</tr>
<tr>
<td></td>
<td></td>
<td>step makes the flipbook play page-by-page, according to the &quot;anim_flipbook: page&quot; command</td>
</tr>
<tr>
<td></td>
<td></td>
<td>off (default) deactivates the flipbook animation</td>
</tr>
</tbody>
</table>

Example Usage:

anim_flipbook: run_type auto

or

anim_flipbook: run_type step
anim_flipbook: page 1.000000
anim_flipbook: page 2.000000
anim_flipbook: page 3.000000
or
anim_flipbook: run_type off

See Also:

Associated anim_flipbook commands
**anim_flipbook: save_images**

**Command:**

```
anim_flipbook: save_images <filename_prefix>
```

**Purpose:**

Specify the file name prefix into which each flipbook animation page (or each image) will be recorded.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename_prefix</td>
<td>file name prefix of the recorded media</td>
</tr>
</tbody>
</table>

**Notes:**

Each page image will be saved into a file of the form "fileprefix_ipage.ext" where "filename_prefix" is the path and name of the file, "ipage" is the corresponding page number, and "ext" is the appropriate image format extension name.

**Example Usage:**

```python
# Set the recording image format to sgi RGB
# file: image_format sgi_rgb
#
# Record each page of the flipbook of main graphics window size
# into a file named "demo_ipage.rgb" where "ipage" is the page number of the animation.
#
anim_flipbook: save_win_type normal
anim_flipbook: save_images demo
```

**See Also:**

Associated **anim_flipbook** commands
**Command:**

```
anim_flipbook: save_multiple_images <toggle>
```

**Purpose:**

When recording an animation flipbook with a detached display this option will save a file for each display if on. If off will save a single file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

When saving a flat-wall detached display, the user can choose to write one large image for the wall or one image per 'pipe' from the dconfig file. Only used if the `anim_flipbook: save_win_type` is set to "detached_display".

**Example Usage:**

```
# Set the recording image format to be envideo
#
file: image_format envideo
#
# Record flipbook images from the detached display
#
anim_flipbook: save_win_type detached_display
anim_flipbook: save_multiple_images ON
anim_flipbook: save_images /tmp/test_movie
```

**See Also:**

Associated `anim_flipbook` commands
anim_flipbook: save_win_size

Command:

    anim_flipbook: save_win_size <x_size> <y_size>

Purpose:

Specify the x and y window dimensions of the flipbook animation images.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>x_size</td>
<td>x window size, or width of the window, in screen coordinates</td>
</tr>
<tr>
<td></td>
<td>y_size</td>
<td>y window size, or height of the window, in screen coordinates</td>
</tr>
</tbody>
</table>

Notes:

Only applicable with command option "anim_flipbook: save_win_type user_defined".

Example Usage:

```
# Set the recording image format to sgi RGB
# record each page of the flipbook of main graphics window size
# into a file named "demo_ipage.rgb" where "ipage" is the page
# number of the animation.
#
anim_flipbook: save_win_type user_defined
anim_flipbook: save_win_size 320 240
anim_flipbook: save_images demo
```

See Also:

Associated anim_flipbook commands
anim_flipbook: save_win_type

Command:

    anim_flipbook: save_win_type <size>

Purpose:

Specify the size of the window/image into which to play/record the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>size</td>
<td>normal (default) corresponds to the current size of the main view graphics window</td>
</tr>
<tr>
<td></td>
<td></td>
<td>user_defined corresponds to the window size specified by the &quot;anim_flipbook: save_win_size&quot; command</td>
</tr>
<tr>
<td></td>
<td>detached_display</td>
<td>use the detached display, as specified by the -dconfig command line argument</td>
</tr>
</tbody>
</table>

Example Usage:

    # Set the recording image format to sgi RGB
    # file: image_format sgi_rgb
    # Record each page of the flipbook of main graphics window size
    # into a file named "demo_ipage.rgb" where "ipage" is the page
    # number of the animation.
    #
    anim_flipbook: save_win_type user_defined
    anim_flipbook: save_win_size 320 240
    anim_flipbook: save_images demo

See Also:

Associated anim_flipbook commands
anim_flipbook: select_all_timesteps

Command:

    anim_flipbook: select_all_timesteps

Purpose:

    When loading a flipbook load all timesteps that exist.

Parameters:

    None.

Notes:

    This command is useful in batch scripts since you do not need to know how many timesteps exist. The command is not generated by interactive use of EnSight.

Example Usage:

    anim_flipbook: select_all_timesteps
    anim_flipbook: load

See Also:

    Associated anim_flipbook commands
Command:

```
anim_flipbook: show_from_page <page_value>
```

Purpose:
Specify the starting page from which to run the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>page_value</td>
<td>a page value which lies within the range of loaded pages</td>
</tr>
</tbody>
</table>

Notes:

This page value must not be greater than the "anim_flipbook: show_to_page" value.

Example Usage:

```
# Preliminary flipbook animation of 21 time steps
anim_flipbook: begin_time_step 30
anim_flipbook: end_time_step 50
anim_flipbook: specify_time_as step
anim_flipbook: load
anim_flipbook: run_type auto

# Reduce flipbook animation to 16 time steps
anim_flipbook: show_from_page 35
```

See Also:

Associated anim_flipbook commands
anim_flipbook: show_to_page

Command:

    anim_flipbook: show_to_page <page_value>

Purpose:

    Specify the ending page to which to run the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>page_value</td>
<td>A page value which lies within the range of loaded pages</td>
</tr>
</tbody>
</table>

Notes:

    This page value must not be less than the "anim_flipbook: show_from_page" value.

Example Usage:

    # Preliminary flipbook animation of 21 time steps
    #
    anim_flipbook: begin_time_step 30
    anim_flipbook: end_time_step 50
    anim_flipbook: specify_time_as step
    anim_flipbook: load
    anim_flipbook: run_type auto
    #
    # Reduce flipbook animation to 11 time steps
    #
    anim_flipbook: show_from_page 35
    anim_flipbook: show_to_page 45

See Also:

    Associated anim_flipbook commands
anim_flipbook: specify_time_as

Command:

```
anim_flipbook: specify_time_as <option>
```

Purpose:

Specify the paging units for the flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>simulation, the flipbook pages will be loaded according to simulation time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>step, (default) the flipbook pages will be loaded according to time step</td>
</tr>
<tr>
<td></td>
<td></td>
<td>settings</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if not transient data.

The default is "step"

Example Usage:

```
# Change time sequence from time step to simulation time
#
solution_time: show_as time
#
# Set begin/end flipbook time info
#
anim_flipbook: specify_time_as simulation
anim_flipbook: begin_simtime 3.5400e+02
anim_flipbook: end_simtime 3.6900e+02
anim_flipbook: load
anim_flipbook: run_type auto
```

See Also:

Associated `anim_flipbook` commands
anim_flipbook: step_by

Command:

    anim_flipbook: step_by <step_increment>

Purpose:

Specify the time step increment by which to run the transient_data flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>step_increment</td>
<td>increment value in time-step units that preferably lies within the range set by the anim_flipbook: begin_time_step and anim_flipbook: end_time_step</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if not transient data. Only pages contained in the valid time-step range will be generated.

Example Usage:

    #
    # Note: transient dataset w/83 time steps...
    # Specify a transient_data flipbook
    #
    anim_flipbook: load_type transient_data
    #
    # Specify page increment
    #
    anim_flipbook: step_by 1.0000e+01
    #
    # Set begin/end flipbook time info
    #
    anim_flipbook: begin_time_step 0
    anim_flipbook: end_time_step 83
    anim_flipbook: specify_time_as step
    #
    # Load and run flipbook pages {0,10,20,30,40,50,60,70,80}
    #
    anim_flipbook: load
    anim_flipbook: run_type auto

See Also:

Associated anim_flipbook commands
Command:

```
anim_flipbook: step_simtime <time_value>
```

Purpose:

Specify the simulation-time increment by which to run the transient_data flipbook animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>increment value in simulation-time units that preferably lies within the range set by the anim_flipbook: begin_simtime and anim_flipbook: end_simtime</td>
</tr>
</tbody>
</table>

Notes:

Not applicable if not transient data. Only pages contained in the valid simulation-time range will be generated.

Example Usage:

```
# Specify time and flipbook sequencing as simulation time
# solution_time: show_as time
anim_flipbook: specify_time_as simulation
#
# Specify time increment
#
anim_flipbook: step_simtime 2.0000e+00
#
# Load and run transient data flipbook
#
anim_flipbook: begin_simtime 3.5400e+02
anim_flipbook: end_simtime 3.6400e+02
#
# Load and run flipbook pages with t=354.0,356.0,358.0,360.0,362.0,364.0
#
anim_flipbook: load
anim_flipbook: run_type auto
```

See Also:

Associated `anim_flipbook` commands
**anim_flipbook: time**

**Command:**

```plaintext
anim_flipbook: time <time_value>
```

**Purpose:**

Specify which page of the flipbook animation to display.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>simulation-time value that corresponds to a loaded page</td>
</tr>
</tbody>
</table>

**Notes:**

Only applicable with `run_type` is set to `step`.

**Example Usage:**

```plaintext
# Manually display 3 pages of the animated flipbook sequences
# that correspond to the simulation time values of 1.1, 2.1, and 3.1.
#
anim_flipbook: run_type step
anim_flipbook: time 1.100000
anim_flipbook: time 1.200000
anim_flipbook: time 1.300000
```

**See Also:**

Associated `anim_flipbook` commands
Commands in this Section:

anim_keyframe

anim_keyframe: acceleration <keyframe> <toggle>
anim_keyframe: animate_transparency <toggle>
anim_keyframe: begin_simtime <time_value>
anim_keyframe: command <key_num> <cmd_num> <command>
anim_keyframe: begin_time_step <step_value>
anim_keyframe: create_keyframe
anim_keyframe: cycle <toggle>
anim_keyframe: delete_back_to <keyframe_num>
anim_keyframe: end_simtime <time_value>
anim_keyframe: end_time_step <step_value>
anim_keyframe: hold <keyframe> <num_frames>
anim_keyframe: keyframing <toggle>
anim_keyframe: restore <filename>
anim_keyframe: run
anim_keyframe: run_from <keyframe_num>
anim_keyframe: run_to <keyframe_num>
anim_keyframe: save <filename>
anim_keyframe: specify_time_as <method>
anim_keyframe: step_by <increment>
anim_keyframe: step_simtime <increment>
anim_keyframe: sub_frames <key1> <key2> <subframes>
anim_keyframe: timeline_arrive_type <action>
anim_keyframe: timeline_delete <timeline>
anim_keyframe: timeline_end_keyframe <keyframe_num>
anim_keyframe: timeline_end_step <time_step>
anim_keyframe: timeline_end_time <time_value>
anim_keyframe: timeline_end_type <time_option>
anim_keyframe: timeline_new
anim_keyframe: timeline_select <timeline>
anim_keyframe: timeline_specify_incr <toggle>
anim_keyframe: timeline_start_keyframe <keyframe_num>
anim_keyframe: timeline_start_step <time_step>
anim_keyframe: timeline_start_time <time_value>
anim_keyframe: timeline_start_type <time_option>
anim_keyframe: timeline_step_increment <delta_step>
anim_keyframe: timeline_time_increment <delta_time>
anim_keyframe: use_interactive_parts <toggle>
anim_keyframe: use_spline <toggle>
anim_keyframe: use_transient_data <toggle>

See Also:

User Manual - Section 7.15, Keyframe Animation
How To Create a Keyframe Animation
How To Animate Transient Data
anim_keyframe: acceleration

Command:

    anim_keyframe: acceleration <keyframe> <toggle>

Purpose:

Toggle acceleration into/out of a keyframe.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>keyframe</td>
<td>The keyframe number to apply the acceleration</td>
</tr>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to apply acceleration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for no acceleration</td>
</tr>
</tbody>
</table>

Example Usage:

    anim_keyframe: keyframing ON
    anim_keyframe: create_keyframe
    view_transf: rotate 20 30 5
    view_transf: translate 5 0 0
    anim_keyframe: create_keyframe
    #
    # accelerate out of keyframe 1
    #
    anim_keyframe: acceleration 1 ON
    anim_keyframe: use_spline ON
    #
    # deaccelerate into keyframe 2
    #
    anim_keyframe: acceleration 2 ON
    anim_keyframe: run

See Also:

Associated anim_keyframe commands
Command:

```plaintext
anim_keyframe: animate_transparency <toggle>
```

Purpose:

Toggles use of animated transparency.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command can be turned on at any time during keyframe recording. If it is on, any transparency modifications made to parts during keyframe specification will be animated during playback. This can be used to create video effects such as fades.

Example Usage:

```plaintext
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
part: select_partname_begin
  "(CASE:Case 1)Isosurface part"
part: select_partname_end
part: modify_begin
part: opaqueness 0.0
part: modify_end
anim_keyframe: create_keyframe
part: modify_begin
part: opaqueness 1.0
part: modify_end
anim_keyframe: create_keyframe
anim_keyframe: animate_transparency ON
anim_keyframe: run
```

See Also:

Associated `anim_keyframe` commands
**anim_keyframe: begin/end_simtime**

**Command:**

```
anim_keyframe: begin_simtime <time_value>
anim_keyframe: end_simtime <time_value>
```

**Purpose:**

Sets the starting simulation time value to use during transient keyframe animations.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>beginning/ending simulation time</td>
</tr>
</tbody>
</table>

**Notes:**

The beginning/ending time step must be a valid value from the simulation. An interpolated value cannot be used.

**Example Usage:**

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transform: zoom 0.561365
anim_keyframe: create_keyframe
anim_keyframe: use_transient_data ON
anim_keyframe: specify_time_as_simulation
anim_keyframe: begin_simtime 4.7000e-02
anim_keyframe: end_simtime 1.1750e-01
anim_keyframe: step_simtime 2.0000e-02
anim_keyframe: run
```

**See Also:**

Associated **anim_keyframe** commands
anim_keyframe: begin/end_time_step

Command:

anim_keyframe: begin_time_step <step_value>
anim_keyframe: end_time_step <step_value>

Purpose:

Sets the starting/ending time step to use during transient keyframe animations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_value</td>
<td>beginning/ending time step</td>
</tr>
</tbody>
</table>

Example Usage:

anim_keyframe: use_transient_data ON
anim_keyframe: step_by 2.0000e+00
anim_keyframe: cycle ON
anim_keyframe: begin_time_step 2
anim_keyframe: end_time_step 15
anim_keyframe: specify_time_as step
anim_keyframe: run

See Also:

Associated anim_keyframe commands
**anim_keyframe: command key**

**Command:**

```
anim_keyframe: command <key_num> <cmd_num> <command>
```

**Purpose:**

Specifies a command to execute for at a particular keyframe.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>key_num</td>
<td>specifies the keyframe</td>
</tr>
<tr>
<td></td>
<td>cmd_num</td>
<td>specifies the command number</td>
</tr>
<tr>
<td>string</td>
<td>command</td>
<td>specifies the command to execute</td>
</tr>
</tbody>
</table>

**Notes:**

During animation playback, when keyframe 'key' is encountered, its commands, if any, will be executed. Up to five commands can be specified for a specific keyframe. If more than five commands are needed, consider using the "play: file.cmd" command to play an external command file. The command string format is the same for any command. Also, consider using the “shell: external_app” command to execute an external application during animation.

**Example Usage:**

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_keyframe: command 1 1 view: full_screen on
anim_keyframe: command 1 2 view: hidden_surface on
anim_keyframe: command 2 1 play: /usr/tmp/ensight_cmds.cmd
anim_keyframe: run
```

**See Also:**

Associated `anim_keyframe` commands
Command:

    anim_keyframe: create_keyframe

Purpose:

    Records the current set of transformations/attributes as a keyframe.

Parameters:

    none

Example Usage:

    anim_keyframe: keyframing ON
    anim_keyframe: create_keyframe
    view_transf: zoom 0.561365
    anim_keyframe: create_keyframe
    anim_keyframe: sub_frames 1 2 30
    anim_keyframe: run

See Also:

    Associated anim_keyframe commands
\textbf{anim_keyframe: cycle}

\textbf{Command:}

\texttt{anim_keyframe: cycle <toggle>}

\textbf{Purpose:}

Toggles whether transient data will cycle during the keyframe animation.

\textbf{Parameters:}

\begin{tabular}{|c|c|p{10cm}|}
\hline
Type & Parameter & Description \\
\hline
constant & toggle & ON cycles (i.e., transient data plays in reverse when arrive at last time value) transient data during the animation \\
& & OFF turns cycling off (i.e., transient data starts playing from \begin{itemize}
\item begin\_time\_step
\item when arrive at last time value
\end{itemize}
\hline
\end{tabular}

\textbf{Example Usage:}

\begin{itemize}
\item \texttt{anim_keyframe: use\_transient\_data ON}
\item \texttt{anim_keyframe: step\_by 2.0000e+00}
\item \texttt{anim_keyframe: cycle ON}
\item \texttt{anim_keyframe: begin\_time\_step 2}
\item \texttt{anim_keyframe: end\_time\_step 15}
\item \texttt{anim_keyframe: specify\_time\_as step}
\item \texttt{anim_keyframe: run}
\end{itemize}

\textbf{See Also:}

Associated \texttt{anim\_keyframe} commands
**Command:**

```
anim_keyframe: delete_back_to <keyframe_num>
```

**Purpose:**

Deletes keyframes back to, but not including, the keyframe specified.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>keyframe_num</td>
<td>keyframe to delete back to</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 1.5
anim_keyframe: create_keyframe
view_transf: zoom 5.0
anim_keyframe: create_keyframe
anim_keyframe: delete_back_to 2
```

**See Also:**

Associated `anim_keyframe` commands
anim_keyframe: hold

Command:

.anim_keyframe: hold <keyframe> <num_frames>

Purpose:

Sets the number of frames to display for a keyframe.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>keyframe</td>
<td>keyframe to control</td>
</tr>
<tr>
<td>int</td>
<td>num_frames</td>
<td>display this many frames</td>
</tr>
</tbody>
</table>

Example Usage:

.anim_keyframe: keyframing ON
.anim_keyframe: create_keyframe
.view_transf: rotate -84.910713 -3.917774 0.000000
.view_transf: function global
.view_transf: rotate 13.660716 39.395405 0.000000
.view_transf: function global
.anim_keyframe: create_keyframe
.anim_keyframe: hold 1 10
.anim_keyframe: run

See Also:

Associated anim_keyframe commands
Command:

```
anim_keyframe: keyframing <toggle>
```

Purpose:

Toggles keyframe animation recording.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turns on keyframe animation recording</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turns off recording and removes any keyframe information</td>
</tr>
</tbody>
</table>

Notes:

Toggling off keyframe animation will delete the previously saved keyframes.

Example Usage:

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: rotate 28.489212 79.540230 0.000000
anim_keyframe: create_keyframe
anim_keyframe: run
anim_keyframe: keyframing OFF
```

See Also:

Associated `anim_keyframe` commands
anim_keyframe: restore/save

Command:

    anim_keyframe: restore <filename>
    anim_keyframe: save <filename>

Purpose:

Restores/saves keyframe animation data from/to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>file name to use</td>
</tr>
</tbody>
</table>

Example Usage:

    anim_keyframe: save ./my_anim
    anim_keyframe: restore ./my_anim

See Also:

Associated anim_keyframe commands
anim_keyframe: run

Command:

anim_keyframe: run

Purpose:

Plays the keyframe animation.

Parameters:

none

Example Usage:

anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_keyframe: sub_frames 1 2 30
anim_keyframe: run

See Also:

Associated anim_keyframe commands
anim_keyframe: run_from/to

Command:

anim_keyframe: run_from <keyframe_num>
anim_keyframe: run_to <keyframe_num>

Purpose:

Sets the first/last keyframe to use for playback.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>keyframe_num</td>
<td>beginning/ending keyframe</td>
</tr>
</tbody>
</table>

Notes:

When creating an animation with many keyframes, it is often helpful to play back a smaller range of keyframes instead of the entire animation. The value must be between 1 and the number of keyframes. The “run_from” frame must be less than or equal to the “run_to” frame.

Example Usage:

anim_keyframe: run_from 2
anim_keyframe: run_to 3
anim_keyframe: run

See Also:

Associated anim_keyframe commands
Command:

```
anim_keyframe: specify_time_as <method>
```

Purpose:

Specifies whether time values during transient data animations use simulation time or time step number.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>simulation times are simulation values</td>
</tr>
<tr>
<td></td>
<td></td>
<td>step times are step values</td>
</tr>
</tbody>
</table>

Example Usage:

```
anim_keyframe: use_transient_data ON
anim_keyframe: specify_time_as step
anim_keyframe: step_by 2.0000e+00
anim_keyframe: cycle ON
anim_keyframe: begin_time_step 2
anim_keyframe: end_time_step 15
anim_keyframe: run
```

See Also:

Associated `anim_keyframe` commands
anim_keyframe: step_by

Command:

anim_keyframe: step_by <increment>

Purpose:

Specifies the time increment for transient data during keyframe animations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>increment</td>
<td>time step increment</td>
</tr>
</tbody>
</table>

Notes:

For each frame of the animation, the time step will be incremented by this value. If needed and possible, interpolation will be used.

Example Usage:

anim_keyframe: use_transient_data ON
anim_keyframe: specify_time_as step
anim_keyframe: step_by 2.0000e+00
anim_keyframe: begin_time_step 2
anim_keyframe: end_time_step 15
anim_keyframe: run

See Also:

Associated anim_keyframe commands
anim_keyframe: step_simtime

Command:

anim_keyframe: step_simtime <increment>

Purpose:

Sets the simulation time increment to use during transient keyframe animations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>increment</td>
<td>simulation time increment</td>
</tr>
</tbody>
</table>

Notes:

For each frame in the animation, simulation time will increment by this value. If needed and possible, interpolation will be used.

Example Usage:

anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_keyframe: use_transient_data ON
anim_keyframe: cycle ON
anim_keyframe: specify_time_as simulation
anim_keyframe: begin_simtime 4.7000e-02
anim_keyframe: end_simtime 1.1750e-01
anim_keyframe: step_simtime 2.0000e-02
anim_keyframe: run

See Also:

Associated anim_keyframe commands
anim_keyframe: sub_frames

Command:

```
anim_keyframe: sub_frames <key1> <key2> <subframes>
```

Purpose:

Sets the number of in-between frames between keyframes key1 and key2.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>key1</td>
<td>specifies the starting keyframe</td>
</tr>
<tr>
<td>int</td>
<td>key2</td>
<td>specifies the ending keyframe (must be key1 + 1)</td>
</tr>
<tr>
<td>int</td>
<td>subframes</td>
<td>specifies the number of in-between frames between key1 and key2</td>
</tr>
</tbody>
</table>

Notes:

key1 and key2 must be consecutively keyframes.

Example Usage:

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_keyframe: sub_frames 1 2 30
anim_keyframe: run
```

See Also:

Associated `anim_keyframe` commands
Command:

\texttt{anim_keyframe: timeline\_new}

Purpose:

Create a new timeline.

Parameters:

none

Notes:

Is only possible if the previous (if exists) timeline does not completely span the available keyframes

Example Usage:

\begin{verbatim}
# turn on keyframing and create 4 keyframes
# anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
# transient data (and timelines) will be used during the animation
# anim_keyframe: use_transient_data ON
#
anim_keyframe: timeline\_select 1
# the first timeline goes from keyframe 2 to 3 (i.e, no transient data is used for keyframe 1 to 2)
# anim_keyframe: timeline\_start\_keyframe 2
anim_keyframe: timeline\_end\_keyframe 3
# At keyframe 2 the "Begin" (as defined in the solution time dialog) time is used. At keyframe 3 the "End" time is used.
# anim_keyframe: timeline\_start\_type use\_begin
anim_keyframe: timeline\_end\_type use\_end
# Create a new timeline and select it for editing
# anim_keyframe: timeline\_new
anim_keyframe: timeline\_select 2
# This timeline goes from keyframe 3 to 4
# anim_keyframe: timeline\_start\_keyframe 3
anim_keyframe: timeline\_end\_keyframe 4
# At keyframe 3 the current time will be used (which will be the "End" time since the first timeline ends with this time)
# We do not specify the time at keyframe 4 but rather increment time by 1.4 unit for each frame. If we arrive at the begin/end time we will
\end{verbatim}
anim_keyframe: timeline_new

# "swing"
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_time_increment 1.4
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
Command:

```plaintext
anim_keyframe: timeline_select <timeline>
```

Purpose:
Selects an existing timeline for editing.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>timeline</td>
<td>existing timeline to edit</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on keyframing and create 4 keyframes
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe

# transient data (and timelines) will be used during the animation

# transient data (and timelines) will be used during the animation
anim_keyframe: use_transient_data ON

# the first timeline goes from keyframe 2 to 3 (i.e., no transient
data is used for keyframe 1 to 2)
anim_keyframe: timeline_select 1

# At keyframe 2 the "Begin" (as defined in the solution time dialog)
time is used. At keyframe 3 the "End" time is used.
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end

# Create a new timeline and select it for editing
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2

# This timeline goes from keyframe 3 to 4
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4

# At keyframe 3 the current time will be used (which will
be the "End" time since the first timeline ends with this time
We do not specify the time at keyframe 4 but rather increment time
by 1. unit for each frame. If we arrive at the begin/end time we will
"swing"
anim_keyframe: timeline_start_type use_current
```
anim_keyframe: timeline_select

anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_step_increment 1.
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
Command:

```
anim_keyframe: timeline_specify_incr <toggle>
```

Purpose:

When ON specifies that a time increment is to be used for the selected timeline.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: to specify a time increment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: to not specify a time increment</td>
</tr>
</tbody>
</table>

Example Usage:

```
# turn on keyframing and create 4 keyframes
#
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
#
# transient data (and timelines) will be used during the animation
#
anim_keyframe: use_transient_data ON
#
#
anim_keyframe: timeline_select 1
#
# the first timeline goes from keyframe 2 to 3 (i.e., no transient
# data is used for keyframe 1 to 2)
#
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
#
# At keyframe 2 the "Begin" (as defined in the solution time dialog)
# time is used. At keyframe 3 the "End" time is used.
#
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
#
# Create a new timeline and select it for editing
#
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
#
# This timeline goes from keyframe 3 to 4
#
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
#
# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
# We do not specify the time at keyframe 4 but rather increment time
# by 1. unit for each frame. If we arrive at the begin/end time we will
# "swing"
#`
anim_keyframe: timeline_specify_incr

anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_step_increment 1.
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
anim_keyframe: timeline_arrive_type

Command:

\[
\text{anim_keyframe: timeline_arrive_type <action>}
\]

Purpose:

Specifies the action to be taken when the min/max time is encountered.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>action</td>
<td>swing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>play time in reverse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>loop</td>
</tr>
<tr>
<td></td>
<td></td>
<td>set time to the begin/end</td>
</tr>
</tbody>
</table>

Notes:

Only used if "anim_keyframe: timeline_specify_incr" is ON

Example Usage:

```bash
# turn on keyframing and create 4 keyframes
#
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
#
# transient data (and timelines) will be used during the animation
#
anim_keyframe: use_transient_data ON
#
# timeline select 1
#
# the first timeline goes from keyframe 2 to 3 (i.e, no transient
# data is used for keyframe 1 to 2)
#
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
#
# At keyframe 2 the "Begin" (as defined in the solution time dialog)
# time is used. At keyframe 3 the "End" time is used.
#
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
#
# Create a new timeline and select it for editing
#
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
#
# This timeline goes from keyframe 3 to 4
#
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
#
# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
anim_keyframe: timeline_arrive_type

# We do not specify the time at keyframe 4 but rather increment time
# by 1.4 unit for each frame. If we arrive at the begin/end time we will
# "swing"
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_time_increment 1.4
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
Command:

```
anim_keyframe: timeline_delete <timeline>
```

Purpose:

Delete a timeline.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>timeline</td>
<td>timeline number to delete</td>
</tr>
</tbody>
</table>

Example Usage:

```
# turn on keyframing and create 4 keyframes
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
# transient data (and timelines) will be used during the animation
# anim_keyframe: use_transient_data ON
# anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
# This timeline goes from keyframe 3 to 4
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
# delete the first timeline
anim_keyframe: timeline_delete 1
```

See Also:

Associated `anim_keyframe` commands
anim_keyframe: timeline_start/end_keyframe

Command:

anim_keyframe: timeline_start_keyframe <keyframe_num>
anim_keyframe: timeline_end_keyframe <keyframe_num>

Purpose:

Sets the begin/end keyframes for the timeline.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>keyframe_num</td>
<td>beginning/ending keyframe for the timeline</td>
</tr>
</tbody>
</table>

Example Usage:

```
#  
# turn on keyframing and create 4 keyframes
#  
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
#  
# transient data (and timelines) will be used during the animation
#  
anim_keyframe: use_transient_data ON
#  
# anim_keyframe: timeline_select 1
#  
# the first timeline goes from keyframe 2 to 3 (i.e, no transient data is used for keyframe 1 to 2)
#  
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
#  
# At keyframe 2 the "Begin" (as defined in the solution time dialog) time is used. At keyframe 3 the "End" time is used.
#  
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
#  
# Create a new timeline and select it for editing
#  
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
#  
# This timeline goes from keyframe 3 to 4
#  
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
#  
# At keyframe 3 the current time will be used (which will be the "End" time since the first timeline ends with this time
# We do not specify the time at keyframe 4 but rather increment time by 1. unit for each frame. If we arrive at the begin/end time we will "swing"
#  
```
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_step_increment 1.
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
anim_keyframe: timeline_start/end_step

Command:

```
anim_keyframe: timeline_start_step <time_step>
anim_keyframe: timeline_end_step <time_step>
```

Purpose:
Sets the start/end timeline step value if being specified.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>The time value (step) for the start/end of the timeline</td>
</tr>
</tbody>
</table>

Notes:
Only used if "anim_keyframe: timeline_start/end_type specify" is also set.

Example Usage:
```
# turn on keyframing and create 4 keyframes
# anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
# transient data (and timelines) will be used during the animation
# anim_keyframe: use_transient_data ON
#
anim_keyframe: timeline_select 1
# the first timeline goes from keyframe 2 to 3 (i.e, no transient
data is used for keyframe 1 to 2)
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
# At keyframe 2 the "Begin" (as defined in the solution time dialog)
time is used. At keyframe 3 the "End" time is used.
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
# Create a new timeline and select it for editing
# anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
# This timeline goes from keyframe 3 to 4
# anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
```
# At keyframe 4 we set time step to 4.

anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_end_type specify
anim_keyframe: timeline_end_time 4.

See Also:

Associated anim_keyframe commands
**anim_keyframe: timeline_start/end_time**

**Command:**

- `anim_keyframe: timeline_start_time <time_value>`
- `anim_keyframe: timeline_end_time <time_value>`

**Purpose:**

Sets the start/end timeline value if being specified.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>The time value (simulation) for the start/end of the timeline</td>
</tr>
</tbody>
</table>

**Notes:**

Only used if "anim_keyframe: timeline_start/end_type specify" is also set.

**Example Usage:**

```plaintext
# turn on keyframing and create 4 keyframes
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
# transient data (and timelines) will be used during the animation
anim_keyframe: use_transient_data ON

# the first timeline goes from keyframe 2 to 3 (i.e, no transient data is used for keyframe 1 to 2)
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
# At keyframe 2 the "Begin" (as defined in the solution time dialog) time is used. At keyframe 3 the "End" time is used.
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
# Create a new timeline and select it for editing
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
# This timeline goes from keyframe 3 to 4
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
# At keyframe 3 the current time will be used (which will be the "End" time since the first timeline ends with this time
```
# At keyframe 4 we set time to be 40.
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_end_type specify
anim_keyframe: timeline_end_time 40.

See Also:

Associated anim_keyframe commands
anim_keyframe: timeline_start/end_type

Command:

- `anim_keyframe: timeline_start_type <time_option>`
- `anim_keyframe: timeline_end_type <time_option>`

Purpose:

Sets the begin/end time for the timeline.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>time_option</td>
<td><code>use_begin</code> Time is set to the &quot;Beg&quot; time as defined in the solution time dialog.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>use_end</code> Time is set to the &quot;End&quot; time as defined in the solution time dialog.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>use_current</code> Time is set to the current time value</td>
</tr>
<tr>
<td></td>
<td></td>
<td><code>specify</code> Time is set to the time value specified by &quot;timeline_end_time&quot;, &quot;timeline_end_step&quot;, &quot;timeline_start_time&quot; or &quot;timeline_end_time&quot;</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on keyframing and create 4 keyframes
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
# transient data (and timelines) will be used during the animation
#
anim_keyframe: use_transient_data ON
#
anim_keyframe: timeline_select 1
# the first timeline goes from keyframe 2 to 3 (i.e, no transient data is used for keyframe 1 to 2)
#
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
# At keyframe 2 the "Begin" (as defined in the solution time dialog) time is used. At keyframe 3 the "End" time is used.
#
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
# Create a new timeline and select it for editing
#
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
# This timeline goes from keyframe 3 to 4
```
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
#
# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
# We do not specify the time at keyframe 4 but rather increment time
# by 1. unit for each frame. If we arrive at the begin/end time we will
# "swing"
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_step_increment 1.
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
anim_keyframe: timeline_step_increment

Command:

    anim_keyframe: timeline_step_increment <delta_step>

Purpose:

Specifies the time step increment when timeline_specify_incr is ON.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>delta_step</td>
<td>The time step increment between frames during the timeline</td>
</tr>
</tbody>
</table>

Notes:

Only used if "anim_keyframe: timeline_specify_incr" is ON
See "anim_keyframe: timeline_time_increment" to specify the time increment in time units instead of step units.

Example Usage:

```
# turn on keyframing and create 4 keyframes
#
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
#
# transient data (and timelines) will be used during the animation
#
anim_keyframe: use_transient_data ON
#
# anim_keyframe: timeline_select 1
#
# the first timeline goes from keyframe 2 to 3 (i.e, no transient
data is used for keyframe 1 to 2)
#
anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
#
# At keyframe 2 the "Begin" (as defined in the solution time dialog)
time is used. At keyframe 3 the "End" time is used.
#
anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
#
# Create a new timeline and select it for editing
#
anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
#
# This timeline goes from keyframe 3 to 4
#
anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
```
anim_keyframe: timeline_step_increment

# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
# We do not specify the time at keyframe 4 but rather increment time
# by 1. unit for each frame. If we arrive at the begin/end time we will
# "swing"
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_step_increment 1.
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
**anim_keyframe: timeline_time_increment**

**Command:**

`anim_keyframe: timeline_time_increment <delta_time>`

**Purpose:**

Specifies the time increment when `timeline_specify_incr` is ON.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>delta_time</td>
<td>The time increment between frames during the timeline</td>
</tr>
</tbody>
</table>

**Notes:**

Only used if "anim_keyframe: timeline_specify_incr" is ON

See "anim_keyframe: timeline_time_increment" to specify the time increment in step units instead of time units.

**Example Usage:**

```
#  # turn on keyframing and create 4 keyframes
#  anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
#  # transient data (and timelines) will be used during the animation
#  anim_keyframe: use_transient_data ON
#  #  anim_keyframe: timeline_select 1
#  #  # the first timeline goes from keyframe 2 to 3 (i.e, no transient
#  #  data is used for keyframe 1 to 2)
#  #  anim_keyframe: timeline_start_keyframe 2
anim_keyframe: timeline_end_keyframe 3
#  #  # At keyframe 2 the "Begin" (as defined in the solution time dialog)
#  #  time is used. At keyframe 3 the "End" time is used.
#  #  anim_keyframe: timeline_start_type use_begin
anim_keyframe: timeline_end_type use_end
#  #  # Create a new timeline and select it for editing
#  #  anim_keyframe: timeline_new
anim_keyframe: timeline_select 2
#  #  # This timeline goes from keyframe 3 to 4
#  #  anim_keyframe: timeline_start_keyframe 3
anim_keyframe: timeline_end_keyframe 4
#```
# At keyframe 3 the current time will be used (which will
# be the "End" time since the first timeline ends with this time
# We do not specify the time at keyframe 4 but rather increment time
# by 1.4 unit for each frame. If we arrive at the begin/end time we will
# "swing"
#
anim_keyframe: timeline_start_type use_current
anim_keyframe: timeline_specify_incr ON
anim_keyframe: timeline_time_increment 1.4
anim_keyframe: timeline_arrive_type swing

See Also:

Associated anim_keyframe commands
**anim_keyframe: use_interactive_parts**

**Command:**

`anim_keyframe: use_interactive_parts <toggle>`

**Purpose:**

Toggles use of animated isosurfaces or clip planes.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turns on use of interactive part modifications during animation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turns off use of interactive part modifications during animation</td>
</tr>
</tbody>
</table>

**Notes:**

This command can be turned on at any time during keyframe recording. If it is on, any isosurfaces or clips that were interactively changed during recording will be animated.

**Example Usage:**

```plaintext
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
part: select_partname_begin
"(CASE:Case 1)Isosurface part"
part: select_partname_end
part: modify_begin
isos: value 9.9000e-01
part: modify_end
anim_keyframe: create_keyframe
anim_keyframe: use_interactive_parts ON
anim_keyframe: run
```

**See Also:**

Associated `anim_keyframe` commands
**Command:**

```
anim_keyframe: use_spline <toggle>
```

**Purpose:**

Enable spline interpolation for keyframe animation translations and look at/from changes.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

You must have more than 2 keyframes for spline interpolation.

**Example Usage:**

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: translate 5 0 0
anim_keyframe: create_keyframe
view_transf: translate 0 5 0
anim_keyframe: create_keyframe
anim_keyframe: use_spline ON
anim_keyframe: acceleration 3 ON
anim_keyframe: run
```

**See Also:**

Associated `anim_keyframe` commands
anim_keyframe: use_transient_data

Command:

    anim_keyframe: use_transient_data <toggle>

Purpose:

Toggles whether transient data will be used during the keyframe animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> turns on use of transient data</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> turns off use of transient data</td>
</tr>
</tbody>
</table>

Notes:

When using transient data, each frame (keyframes and in-betweens) will use the next transient time value.

Example Usage:

    anim_keyframe: use_transient_data ON
    anim_keyframe: specify_time_as step
    anim_keyframe: step_by 2.0000e+00
    anim_keyframe: begin_time_step 2
    anim_keyframe: end_time_step 15
    anim_keyframe: run

See Also:

Associated anim_keyframe commands
Commands in this Section:

**anim_quick**

- `anim_quick: accelerate_first <toggle>`
- `anim_quick: accelerate_last <toggle>`
- `anim_quick: create_keyframes`
- `anim_quick: explode_direction <direction>`
- `anim_quick: explode_distance <distance>`
- `anim_quick: explode_origin <x_ori> <y_ori> <z_ori>`
- `anim_quick: explode_view <toggle>`
- `anim_quick: fly_around <toggle>`
- `anim_quick: fly_direction <direction>`
- `anim_quick: fly_revolutions <many_revs>`
- `anim_quick: rotate_direction <axis> <direction>`
- `anim_quick: rotate_objects <toggle>`
- `anim_quick: rotate_revolutions <many_revs>`
- `anim_quick: total_frames <num_frames>`

See Also:

- User Manual - Section 7.15, Keyframe Animation
- How To Create a Keyframe Animation
anim_quick: accelerate_first / last

Command:

    anim_quick: accelerate_first <toggle>
    anim_quick: accelerate_last <toggle>

Purpose:

Controls the acceleration for the first/last keyframes created for quick animations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON accelerate at the first/last keyframe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF do not accelerate at the first/last keyframe</td>
</tr>
</tbody>
</table>

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON
# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5
# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated `anim_quick` commands
Command:

anim_quick: create_keyframes

Purpose:

Creates the keyframes for the quick_animation setup.

Parameters:

none

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON
#
# create an exploded view about 2,0,0 in the x direction.
# The exploded distance is set to 200 units
#
anim_quick: explode_view
anim_quick: explode_origin 2 0 0
anim_quick: explode_direction x
anim_quick: explode_distance 200
#
# while rotating the scene about the x axis 2 revolutions positive direction
#
anim_quick: rotate_objects
anim_quick: rotate_direction x positively
anim_quick: rotate_revolutions x 2.000000
#
# accelerate at the first keyframe but not at the last
#
anim_quick: accelerate_first
anim_quick: accelerate_last OFF
#
# create a total of 125 frames
#
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated anim_quick commands
anim_quick: explode_direction

Command:

    anim_quick: explode_direction <direction>

Purpose:

Sets up an exploded view quick animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>direction</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xyz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>radial</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on keyframe animation
# anim_keyframe: keyframing ON
# create an exploded view about 2,0,0 in the x direction.
# The exploded distance is set to 200 units
# anim_quick: explode_view ON
anim_quick: explode_origin 2 0 0
anim_quick: explode_direction x
anim_quick: explode_distance 200
#
# while rotating the scene about the x axis 2 revolutions positive direction
# anim_quick: rotate_objects ON
anim_quick: rotate_direction x positively
anim_quick: rotate_revolutions x 2.000000
#
# accelerate at the first keyframe but not at the last
# anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
#
# create a total of 125 frames
# anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated anim_quick commands
Command:

```plaintext
anim_quick: explode_distance <distance>
```

Purpose:

Sets the exploded view distance.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>distance</td>
<td>the maximum distance a part will be moved</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on keyframe animation

# anim_keyframe: keyframing ON

# create an exploded view about 2,0,0 in the x direction.
# The exploded distance is set to 200 units

# anim_quick: explode_view ON
anim_quick: explode_origin 2 0 0
anim_quick: explode_direction x
anim_quick: explode_distance 200

# while rotating the scene about the x axis 2 revolutions positive direction

# anim_quick: rotate_objects ON
anim_quick: rotate_direction x positively
anim_quick: rotate_revolutions x 2.000000

# accelerate at the first keyframe but not at the last

# anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF

# create a total of 125 frames

# anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated `anim_quick` commands
anim_quick: explode_origin

Command:

    anim_quick: explode_origin <x_ori> <y_ori> <z_ori>

Purpose:

Sets the exploded view origin.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_ori</td>
<td>x coordinate of the explode origin</td>
</tr>
<tr>
<td></td>
<td>y_ori</td>
<td>y coordinate of the explode origin</td>
</tr>
<tr>
<td></td>
<td>z_ori</td>
<td>z coordinate of the explode origin</td>
</tr>
</tbody>
</table>

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON
# create an exploded view about 2,0,0 in the x direction.
# The exploded distance is set to 200 units
anim_quick: explode_view ON
anim_quick: explode_origin 2 0 0
anim_quick: explode_direction x
anim_quick: explode_distance 200
# while rotating the scene about the x axis 2 revolutions positive direction
anim_quick: rotate_objects ON
anim_quick: rotate_direction x positively
anim_quick: rotate_revolutions x 2.000000
# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated anim_quick commands
Command:

\texttt{anim\_quick: explode\_view <toggle>}

Purpose:

Sets up an exploded view quick animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>add exploded view animation</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>do not add exploded view animation</td>
</tr>
</tbody>
</table>

Notes:

The exploded view is not added until a “anim\_quick: create\_keyframes” command.

The exploded view can be used in combination with “rotate\_objects” and “explode\_view”

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON
#
# create an exploded view about 2,0,0 in the x direction.
# The exploded distance is set to 200 units
# anim_quick: explode_view ON
anim_quick: explode_origin 2 0 0
anim_quick: explode_direction x
anim_quick: explode_distance 200
#
# while rotating the scene about the x axis 2 revolutions positive direction
# anim_quick: rotate\_objects ON
anim_quick: rotate_direction x positively
anim_quick: rotate_revolutions x 2.000000
#
# accelerate at the first keyframe but not at the last
# anim_quick: accelerate\_first ON
anim_quick: accelerate\_last OFF
#
# create a total of 125 frames
# anim_quick: total\_frames 125
anim_quick: create\_keyframes
```

See Also:

Associated \texttt{anim\_quick} commands
**anim_quick: fly_around**

**Command:**

```
anim_quick: fly_around <toggle>
```

**Purpose:**

Sets up a fly-around quick animation.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

The fly-around is not added until a “anim_quick: create_keyframes” command.

The fly-around can be used in combination with “rotate_objects” and “explode_view”

**Example Usage:**

```

# turn on keyframe animation
anim_keyframe: keyframing ON
# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5
# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

**See Also:**

Associated `anim_quick` commands
Command:

```
anim_quick: fly_direction <direction>
```

Purpose:

Sets up the direction for a fly-around animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>direction</td>
<td>move look-from position to the right</td>
</tr>
<tr>
<td></td>
<td>left</td>
<td>move look-from position to the left</td>
</tr>
</tbody>
</table>

Notes:

A fly-around moves the look-from position in an arc.

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON
#
# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5
#
# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
#
# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated `anim_quick` commands
anim_quick: fly_revolutions

Command:

    anim_quick: fly_revolutions <many_revs>

Purpose:

Sets the number of revolutions for the fly-around quick animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>many_revs</td>
<td>The number of revolutions to add</td>
</tr>
</tbody>
</table>

Example Usage:

```
# turn on keyframe animation
anim_keyframe: keyframing ON

# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5

# accelerate at the first keyframe but not at the last
#
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF

# create a total of 125 frames
#
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated anim_quick commands
anim_quick: rotate_direction

Command:

    anim_quick: rotate_direction <axis> <direction>

Purpose:

Specifies the direction of the rotation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>specifies direction for x axis</td>
</tr>
<tr>
<td></td>
<td>y</td>
<td>specifies direction for y axis</td>
</tr>
<tr>
<td></td>
<td>z</td>
<td>specifies direction for z axis</td>
</tr>
<tr>
<td>constant</td>
<td>direction</td>
<td>positively positive rotation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>negatively negative rotation</td>
</tr>
</tbody>
</table>

Example Usage:

```
#     # turn on keyframe animation
#     anim_keyframe: keyframing ON
#     # move the camera to the right one half revolution
#     anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5
#     # while rotating the scene about the x axis 2 revolutions negative direc- tion
#     anim_quick: rotate_objects ON
anim_quick: rotate_direction x negatively
anim_quick: rotate_revolutions x 2.000000
#     # accelerate at the first keyframe but not at the last
#     anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
#     # create a total of 125 frames
#     anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated `anim_quick` commands
**anim_quick: rotate_objects**

**Command:**

```
anim_quick: rotate_objects <toggle>
```

**Purpose:**

Sets up a scene rotation for quick animation.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

The rotation is not added until a "anim_quick: create_keyframes" command.

The rotation can be used in combination with “fly_around” and “explode_view”

**Example Usage:**

```
# turn on keyframe animation
anim_keyframe: keyframing ON
# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5
# while rotating the scene about the x axis 2 revolutions negative direction
anim_quick: rotate_objects ON
anim_quick: rotate_direction x negatively
anim_quick: rotate_revolutions x 2.000000
# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF
# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

**See Also:**

Associated **anim_quick** commands
Command:

```
anim_quick: rotate_revolutions <many_revs>
```

Purpose:

Sets the number of revolutions for `rotate_objects` quick animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>many_revs</td>
<td>The number of revolutions to add</td>
</tr>
</tbody>
</table>

Example Usage:

```
#  # turn on keyframe animation
#  anim_keyframe: keyframing ON
#  # move the camera to the right one half revolution
#  anim_quick: fly_around ON
#  anim_quick: fly_direction right
#  anim_quick: fly_revolutions 0.5
#
#  # while rotating the scene about the x axis 2 revolutions negative direction
#  anim_quick: rotate_objects ON
#  anim_quick: rotate_direction x negatively
#  anim_quick: rotate_revolutions x 2.000000
#
#  # accelerate at the first keyframe but not at the last
#  anim_quick: accelerate_first ON
#  anim_quick: accelerate_last OFF
#
#  # create a total of 125 frames
#  anim_quick: total_frames 125
#  anim_quick: create_keyframes
```

See Also:

Associated `anim_quick` commands
anim_quick: total_frames

Command:

    anim_quick: total_frames <num_frames>

Purpose:

Sets the total number of frames (keyframes plus subframes) to be created when a “anim_quick: create_keyframes” command is executed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_frames</td>
<td>The total number of frames that will be created</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on keyframe animation
anim_keyframe: keyframing ON

# move the camera to the right one half revolution
anim_quick: fly_around ON
anim_quick: fly_direction right
anim_quick: fly_revolutions 0.5

# accelerate at the first keyframe but not at the last
anim_quick: accelerate_first ON
anim_quick: accelerate_last OFF

# create a total of 125 frames
anim_quick: total_frames 125
anim_quick: create_keyframes
```

See Also:

Associated anim_quick commands
Commands in this Section:

**anim_recorders**

- `anim_recorders: file_prefix <filename>`
- `anim_recorders: record <toggle>`
- `anim_recorders: render_offscreen <toggle>`

See Also:

- User Manual - Section 7.15, Keyframe Animation
- How To Create a Keyframe Animation
anim_recorders: file_prefix filename

Command:

```plaintext
anim_recorders: file_prefix <filename>
```

Purpose:

Specifies the external file name to use for keyframe animation recording.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>animation file name prefix</td>
</tr>
</tbody>
</table>

Notes:

The filename can also include an optional directory path. The name is a prefix. A suffix will automatically be added that is based on the animation file format (e.g. `.evo` for EnVideo files).

If a single image format is specified (i.e. PostScript), then a four digit sequence number will be added between the prefix and suffix.

Example Usage:

```plaintext
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: rotate 0.0 90.0 0.0
anim_keyframe: create_keyframe
file: image_format envideo
# record envideo file to /tmp/my_animation.evo
anim_recorders: file_prefix /tmp/my_animation
anim_recorders: record ON
anim_keyframe: run
```

See Also:

Associated `anim_recorders` commands
Command:

\texttt{anim\_recorders: record <toggle>}

Purpose:

Records the keyframe animation to an external file(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

\texttt{anim\_keyframe: keyframing ON}
\texttt{anim\_keyframe: create\_keyframe}
\texttt{view\_transf: rotate 0.0 90.0 0.0}
\texttt{anim\_keyframe: create\_keyframe}
\texttt{file: image\_format envideo}
\texttt{anim\_keyframe: create\_keyframe}
\texttt{file\_prefix ./my\_animation}
\texttt{anim\_recorders: record ON}
\texttt{anim\_keyframe: run}

See Also:

Associated \texttt{anim\_recorders} commands
anim_recorders: render_offscreen

Command:

```
anim_recorders: render_offscreen <toggle>
```

Purpose:

Specifies using hardware assisted offscreen rendering for keyframe animation on platforms that support it.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turn on offscreen rendering</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turn off offscreen rendering</td>
</tr>
</tbody>
</table>

Notes:

This depends on an OpenGL feature called pbuffers. It is currently supported on SGI platforms. However, due to bugs in SGI's implementation, it can be problematic. You may need to try different video formats (i.e., use ircombine) to get pbuffer rendering to work correctly.

Example Usage:

```
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: rotate 0.0 90.0 0.0
anim_keyframe: create_keyframe
file: image_format envideo
anim_recorders: file_prefix ./my_animation
anim_recorders: record ON
anim_recorders: render_offscreen ON
anim_keyframe: run
```

See Also:

Associated anim_recorders commands
Commands in this Section:

**anim_screens**

- `anim_screens: save_multiple_images <toggle>`
- `anim_screens: type <size>`
- `anim_screens: x_max <coord>`
- `anim_screens: x_min <coord>`
- `anim_screens: y_max <coord>`
- `anim_screens: y_min <coord>`

See Also:

User Manual - Section 7.15, Keyframe Animation
How To Create a Keyframe Animation
anim_screens: save_multiple_images

Command:

    anim_screens: save_multiple_images <toggle>

Purpose:

Option to save a single image or multiple images from a flat-wall detached display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>size</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to save one image per pipe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to save one image per wall</td>
</tr>
</tbody>
</table>

Notes:

When saving a flat-wall detached display, the user can choose to write one large image for the wall or one image per ‘pipe’ from the dconfig file. This option is only valid when the animation size is detached_display.

Example Usage:

    anim_keyframe: create_keyframe
    view_transf: rotate -4.500000e+01 7.500000e+01 0.000000e+00
    anim_keyframe: create_keyframe
    anim_screens: type detached_display
    anim_screens: save_multiple_images ON

See Also:

Associated anim_screens commands
anim_screens: type

Command:

anim_screens: type <size>

Purpose:

Specifies the size of the graphics window to use during keyframe animation playback.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>size</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>full</td>
</tr>
<tr>
<td>normal</td>
<td></td>
<td>NTSC</td>
</tr>
<tr>
<td>PAL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>user_defined</td>
</tr>
</tbody>
</table>

Notes:

The NTSC window size is 640x480 and corresponds to the size used by US video recording equipment. The PAL window size is 720x576. It is used by most foreign recording equipment. NTSC and PAL sizes have their window origins in the lower left corner of the monitor. user_defined windows can be located anywhere on the monitor.

Example Usage:

```plaintext
# This plays a keyframe animation in a 320x200 window.
#
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_screens: type user_defined
anim_screens: x_min 0
anim_screens: x_max 319
anim_screens: y_min 0
anim_screens: y_max 199
anim_keyframe: run
```

See Also:

Associated anim_screens commands
anim_screens: x/y_max/min

Command:

anim_screens: x_max <coord>
anim_screens: x_min <coord>
anim_screens: y_max <coord>
anim_screens: y_min <coord>

Purpose:

Specifies the right x/y coordinate of the keyframe animation window during playback.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>coord</td>
<td>screen coordinate of the left (x_min), right (x_max), bottom (y_min) and top (y_max)</td>
</tr>
</tbody>
</table>

Notes:

The range is 0 to maximum graphics resolution - 1.

Example Usage:

# This plays a keyframe animation in a 320x200 window.
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
view_transf: zoom 0.561365
anim_keyframe: create_keyframe
anim_screens: type user_defined
anim_screens: x_min 0
anim_screens: x_max 319
anim_screens: y_min 0
anim_screens: y_max 199
anim_keyframe: run

See Also:

Associated anim_screens commands
Commands in this Section:

**anim_traces**

- `anim_traces: color_by <option>`
- `anim_traces: delta_time <time_value>`
- `anim_traces: head_detail <detail_value>`
- `anim_traces: head_scale <scale_value>`
- `anim_traces: head_size_by <option>`
- `anim_traces: head_type <option>`
- `anim_traces: head_variable <variable_name>`
- `anim_traces: line_width <width_value>`
- `anim_traces: max_time <time_value>`
- `anim_traces: multiple_pulses <toggle>`
- `anim_traces: particle_time <time_value>`
- `anim_traces: pulse_interval <time_value>`
- `anim_traces: RGB <red_val> <grn_val> <blu_val>`
- `anim_traces: set_max_time <toggle>`
- `anim_traces: start_time <time_value>`
- `anim_traces: sync_to_transient <toggle>`

See Also:

- User Manual - Section 7.4, Particle Trace Create/Update
- How To Animate Particle Traces
**anim_traces: color_by**

**Command:**

```
anim_traces: color_by <option>
```

**Purpose:**

Specify the option by which to color the animated traces on the selected part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td><code>constant_color</code> color the animated traces by a constant color</td>
</tr>
<tr>
<td></td>
<td><code>calculated_color</code> (default) color the animated traces the same as the part(s)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

The color of the `constant_color` option is specified by the "anim_traces: RGB" command.

**Example Usage:**

```
# Select the particle trace part(s) to animate
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Color by constant color of magenta
#
anim_traces: color_by constant_color
anim_traces: RGB 1.0000e+00 0.0000e+00 1.0000e+00
```

**See Also:**

Associated `anim_traces` commands
anim_traces: delta_time

Command:

`anim_traces: delta_time <time_value>`

Purpose:

Specify how fast (the speed) the animated traces move for the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>the time that the traces are incremented by between display frames</td>
</tr>
</tbody>
</table>

Notes:

This parameter is not applicable when using "anim_traces: sync_to_transient ON", and displaying transient data through flipbook or keyframe animation.

Example Usage:

```
# Select the particle trace part(s) to animate
#
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Specify a delta time
#
anim_traces: delta_time 1.0000e-05
```

See Also:

Associated `anim_traces` commands
anim_traces: head_detail

Command:

anim_traces: head_detail <detail_value>

Purpose:

Specifies the detail-level of the head representation of all animated traces of the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>detail_value</td>
<td>The detail-level of the head of all animated traces in range I[2,10] with 10 being the most detailed (default = 3.). The higher the detail level, the rounder the sphere head</td>
</tr>
</tbody>
</table>

Notes:

Not applicable when head type is none. Higher detail levels take longer to draw; thus, slowing performance.

Example Usage:

```plaintext
# Select the particle trace part(s) to animate
#
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle animated trace segment head type to spheres
#
anim_traces: head_type sphere
anim_traces: head_detail 4.0000+e00
```

See Also:

Associated anim_traces commands
Command:

`anim_traces: head_scale <scale_value>`

Purpose:

Specify the scaling factor for the head size.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td><code>scale_value</code></td>
<td>scale factor to apply to the head size.</td>
</tr>
</tbody>
</table>

Notes:

Not applicable when head type is none.

If `head_size_by` is constant, the scale factor is the diameter of the sphere. If `head_size_by` is set to a scalar or vector the factor scales the variable selected.

Example Usage:

```
# Select the particle trace part(s) to animate
#
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle animated trace segment head type to spheres
#
anim_traces: head_type sphere
anim_traces: head_scale 1.0000e-01
```

See Also:

Associated `anim_traces` commands
anim_traces: head_size_by

Command:

anim_traces: head_size_by <option>

Purpose:

Specify which variable type to use to size the head of each animated trace segment of the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>constant (default) sizes the head using just the scale factor value (anim_traces: head_scale &lt;scale value&gt;)</td>
</tr>
<tr>
<td>scalar</td>
<td></td>
<td>sizes the head using the specified scalar variable</td>
</tr>
<tr>
<td>vector_mag</td>
<td></td>
<td>sizes the head using the magnitude of the specified vector variable</td>
</tr>
<tr>
<td>vector_xcomp</td>
<td></td>
<td>sizes the head using the x component of the specified vector variable</td>
</tr>
<tr>
<td>vector_ycomp</td>
<td></td>
<td>sizes the head using the y component of the specified vector variable</td>
</tr>
<tr>
<td>vector_zcomp</td>
<td></td>
<td>sizes the head using the z component of the specified vector variable</td>
</tr>
</tbody>
</table>

Notes:

Not applicable when head type is none. The head size is determined by multiplying the scale factor (anim_traces: head_scale) by the specified variable (anim_traces: head_variable) value.

Example Usage:

```plaintext
# Select the particle trace part(s) to animate
# part: select_begin
# 2
# part: select_end
# # Toggle off the visibility of the selected particle trace part(s), and animate them.
# part: modify_begin
# part: visible OFF
# part: animate ON
# part: modify_end
# # Toggle animated trace segment head type to spheres
# and size by velocity magnitude
# anim_traces: head_type sphere
# anim_traces: head_size_by vector_mag
# anim_traces: head_variable Velocity
```

See Also:

Associated anim_traces commands
Command:

\texttt{anim\_traces: head\_type <option>}

Purpose:

Specify the type of head for each animated trace segment for the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>none (default) no head will appear for each animated trace segment, just a plain line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>arrow Use an arrow to represent the head, or leading edge, of each animated trace segment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sphere use a sphere to represent the head, or leading edge, of each animated trace segment</td>
</tr>
</tbody>
</table>

Notes:

The following commands help control the size of the sphere at the head of each animated particle trace.

\texttt{anim\_traces: head\_detail}
\texttt{anim\_traces: head\_scale}
\texttt{anim\_traces: head\_size\_by}

Example Usage:

\begin{verbatim}
# Select the particle trace part(s) to animate
# part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle animated trace segment head type to spheres
#
anim\_traces: head\_type sphere
\end{verbatim}

See Also:

Associated \texttt{anim\_traces} commands
**anim_traces: head_variable**

**Command:**

```plaintext
anim_traces: head_variable <variable_name>
```

**Purpose:**

Specify the variable to use in scaling the head of the animated trace segments of the selected particle trace part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>variable name to use in scaling the heads of the animated trace segments</td>
</tr>
</tbody>
</table>

**Notes:**

Not applicable for "anim_traces: head_sized_by constant". The scale factor (anim_traces: head_scale) will be applied to the value of the specified variable at the location of the head of the animated trace. Variable must be active.

**Example Usage:**

```plaintext
# Select the particle trace part(s) to animate
#
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle animated trace segment head type to spheres and size by velocity magnitude
#
anim_traces: head_type sphere
anim_traces: head_size_by vector_mag
anim_traces: head_variable Velocity
```

**See Also:**

Associated `anim_traces` commands
anim_traces: line_width

Command:

```
anim_traces: line_width <width_value>
```

Purpose:

Specify line width of the animated trace segments for the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>width_value</td>
<td>width of the animated trace line segments (default = 2)</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select the particle trace part(s) to animate
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Specify line width to be 3
#
anim_traces: line_width 3.0000e+01
```

See Also:

Associated anim_traces commands
**anim_traces: max_time**

**Command:**

```plaintext
anim_traces: max_time <time_value>
```

**Purpose:**

Specify the maximum particle duration.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>time at which to end the animated trace</td>
</tr>
</tbody>
</table>

**Notes:**

Used in conjunction with "anim_traces: set_max_time ON".

**Example Usage:**

```plaintext
# Select the particle trace part(s) to animate
# part: select_begin
part: select_end
2
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# End trace animation at .5
#
anim_traces: set_max_time ON
anim_traces: max_time 5.0000e-01
```

**See Also:**

Associated `anim_traces` commands
Command:

```
anim_traces: multiple_pulses <toggle>
```

Purpose:

Toggles on/off multiple emission of animated traces for the selected particle trace part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON enables additional animated traces to appear after each specified pulse interval (anim_traces: pulse_interval &lt;interval value&gt;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF (default) Only one animated trace appears at the specified start time (anim_traces: start_time &lt;time value&gt;) for each particle trace</td>
</tr>
</tbody>
</table>

Notes:

Not applicable to pathlines. The pulse interval is controlled via the "anim_traces: pulse_interval" command.

When ON, will start a set of animated traces every <time_value> time units (as specified via the "pulse_interval" command).

Example Usage:

```
# Select the particle trace part(s) to animate
# part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle on multiple animated trace pulses
#
anim_traces: multiple_pulses ON
anim_traces: pulse_interval 1.0000e-03
```

See Also:

Associated anim_traces commands
anim_traces: particle_time

Command:

```
anim_traces: particle_time <time_value>
```

Purpose:

Specify the time duration (length) of the animated trace segments.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>length in units of time of the animated trace segment</td>
</tr>
</tbody>
</table>

Notes:

The particle trace length parameter scales the length of all animated traces at all times.
The animated trace segments will be short when speed is low and long when speed is high.

Example Usage:

```
# Select the particle trace part(s) to animate
# part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Specify a animated trace length
# anim_traces: particle_time 1.0000e-04
```

See Also:

Associated `anim_traces` commands
Command:

`anim_traces: pulse_interval <time_value>`

Purpose:

Specifies the time delay when using multiple animated trace pulses;

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>time delay interval between trace pulses</td>
</tr>
</tbody>
</table>

Notes:

Not applicable when "anim_traces: multiple_pulses OFF".

Example Usage:

```
# Select the particle trace part(s) to animate
# part: select_begin
part: select_end 2
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
# Toggle on multiple animated trace pulses
# anim_traces: multiple_pulses ON
anim_traces: pulse_interval 1.0000e-03
```

See Also:

Associated `anim_traces` commands
anim_traces: RGB

Command:

    anim_traces: RGB <red_val> <grn_val> <blu_val>

Purpose:

Specify the color for animated traces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color component values given in I[0.,1.]</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with the "anim_traces: color_by constant" command.

Example Usage:

```plaintext
# Select the particle trace part(s) to animate
# part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Color by constant color of magenta
# anim_traces: color_by constant
anim_traces: RGB 1.0000e+00 0.0000e+00 1.0000e+00
```

See Also:

Associated anim_traces commands
Command:

`anim_traces: set_max_time <toggle>`

Purpose:

Toggles on/off the maximum lifetime for all animated traces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON  trances animate until the until maximum time is reached</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF (default) trances animate until the end of the particle trace is reached</td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with "`anim_traces: max_time`".

Example Usage:

```
# Select the particle trace part(s) to animate
# part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and animate them.
# part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# End trace animation at simulation time .5
#
anim_traces: set_max_time ON
anim_traces: max_time 5.0000e-01
```

See Also:

Associated `anim_traces` commands
anim_traces: start_time

Command:
anim_traces: start_time <time_value>

Purpose:
Specifies the time value to start the particle animation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>time at which to begin the animated traces</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select the particle trace part(s) to animate
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and
# animate them.
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Start animated traces at .1 rather than 0.
#
anim_traces: start time 1.0000e-01
```

See Also:
Associated anim_traces commands
anim_traces: sync_to_transient

Command:

```
anim_traces: sync_to_transient <toggle>
```

Purpose:

Toggles on/off synchronization of animated tracer position to solution time of transient data.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>when transient data is in use, each tracer is displayed with its leading-end at the correct location along the particle trace corresponding to the current solution time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>animated traces not synchronized with transient data</td>
</tr>
</tbody>
</table>

Notes:

Only applicable with transient data cases. (See "solution_time: current_step" and "solution_time: update_to_current").

Example Usage:

```
# Set the
# solution_time: current_step 4.0000e+01
solution_time: update_to_current
#
# Select the particle trace part(s) to animate
#
part: select_begin
2
part: select_end
#
# Toggle off the visibility of the selected particle trace part(s), and animate them.
#
part: modify_begin
part: visible OFF
part: animate ON
part: modify_end
#
# Toggle off synchronization with transient data
#
anim_traces: sync_to_transient OFF
```

See Also:

Associated anim_traces commands
anim_traces: sync_to_transient
Commands in this Section:

annot_entlbl

annot_entlbl: element_rgb <red_val> <grn_val> <blu_val>
annot_entlbl: element_threshold_high <element_id>
annot_entlbl: element_threshold_low <element_id>
annot_entlbl: element_thresholds <filter_setting>
annot_entlbl: node_rgb <red_val> <grn_val> <blu_val>
annot_entlbl: node_threshold_high <node_id>
annot_entlbl: node_threshold_low <node_id>
annot_entlbl: node_thresholds <filter_setting>

See Also:

User Manual - Section 8.1, Part Mode
Command:

annotate_entlbl: element_rgb <red_val> <grn_val> <blu_val>

Purpose:

Sets the color of element id labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue component of the color (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This is a normal rgb color triple. The effect of this command is global - namely, all element labels are affected.

Example Usage:

annotate_entlbl: element_rgb 1.000000 0.400000 0.800000

See Also:

Associated annotate_entlbl commands
Command:

```
annot_entlbl: element_threshold_high <element_id>
annot_entlbl: element_threshold_low <element_id>
```

Purpose:

Sets the high/low threshold value for element label filtering.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>element_id</td>
<td>high/low threshold element id</td>
</tr>
</tbody>
</table>

Notes:

The threshold high/low value is used according to the filter method set in the `annot_entlbl: element_thresholds` associated command.

Example Usage:

```
annot_entlbl: element_thresholds band
annot_entlbl: element_threshold_low 30
annot_entlbl: element_threshold_high 1200
```

See Also:

Associated `annot_entlbl` commands
Command:

\texttt{annot\_entlbl: element\_thresholds <filter\_setting>}

Purpose:

Sets method to use for filtering element labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>filter_setting</td>
<td>low Element numbers below the low threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high Element numbers above the high threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>band Element numbers between the low and high threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>low_high Element numbers below the low and above the high thresholds are not displayed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none No element labels are displayed.</td>
</tr>
</tbody>
</table>

Notes:

This command sets the method. The threshold low and high values are set in associated commands.

Example Usage:

\begin{verbatim}
annot\_entlbl: element\_thresholds band
annot\_entlbl: element\_threshold\_low 30
annot\_entlbl: element\_threshold\_high 1200
\end{verbatim}

See Also:

Associated \texttt{annot\_entlbl} commands
Command:

```
annot_entlbl: node_rgb <red_val> <grn_val> <blu_val>
```

Purpose:
Sets the color of node id labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue components of the color (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
This is a normal rgb color triple. The effect of this command is global - namely, all node labels are affected.

Example Usage:
```
annot_entlbl: node_rgb 0.000000 1.000000 0.800000
```

See Also:
Associated `annot_entlbl` commands
annot_entlbl: node_threshold_high/low

Command:

annot_entlbl: node_threshold_high <node_id>
annot_entlbl: node_threshold_low <node_id>

Purpose:

Sets the high/low threshold value for node label filtering.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>node_id</td>
<td>high/low threshold node id</td>
</tr>
</tbody>
</table>

Notes:

The threshold high/low value is used according to the filter method set in the annot_entlbl: node_thresholds associated command.

Example Usage:

annot_entlbl: node_thresholds low_high
annot_entlbl: node_threshold_low 2
annot_entlbl: node_threshold_high 20

See Also:

Associated annot_entlbl commands
Command:

annot_entlbl: node_thresholds <filter_setting>

Purpose:
Sets method to use for filtering node labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>filter_setting</td>
<td></td>
</tr>
<tr>
<td></td>
<td>low</td>
<td>node numbers below the low threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>node numbers above the high threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td>band</td>
<td>node numbers between the low and high threshold are not displayed.</td>
</tr>
<tr>
<td></td>
<td>low_high</td>
<td>node numbers below the low and above the high thresholds are not displayed.</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>no node labels are displayed.</td>
</tr>
</tbody>
</table>

Notes:
This command sets the method. The threshold low and high values are set in associated commands.

Example Usage:

annot_entlbl: node_thresholds low_high
annot_entlbl: node_threshold_low 2
annot_entlbl: node_threshold_high 20

See Also:
Associated annot_entlbl commands
annot_entlbl: node_thresholds
Commands in this Section:

annotation

- annotation: axis_global <toggle>
- annotation: axis_local <toggle>
- annotation: axis_model <toggle>
- annotation: deselect_all
- annotation: element_labeling <toggle>
- annotation: legend <toggle>
- annotation: node_labeling <toggle>
- annotation: text_display <toggle>

See Also:

- User Manual - Section 8.2, Annot Mode
- How To Create Color Legends
- How To Create Lines and Arrows
- How To Create Text Annotation
- How To Load Custom Logos
annotation: axis_global

Command:

    annotation: axis_global <toggle>

Purpose:

Turns the global axis triad on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turn the triad on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turn the triad off</td>
</tr>
</tbody>
</table>

Notes:

The global axis' origin is located at the centroid of the visible geometry. Its location is recomputed when the viewport is re initialized. The global axis will have 'G' at its origin to distinguish it from other axes.

Example Usage:

    annotation: axis_global ON

See Also:

Associated annotation commands
Command:

```
annotation: axis_local <toggle>
```

Purpose:

Toggles the global attribute controlling local frame visibility.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turn the global toggle on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turn the global toggle off</td>
</tr>
</tbody>
</table>

Notes:

Local coordinate frames are visible only if their axis visibility attribute are on AND the global toggle described here is ON.

Example Usage:

```
frame: create
frame: select_begin 1
frame: select_end
annotation: axis_local ON
frame: x_labels ON
frame: len_x 1.0000e+03
frame: len_y 7.4565e+02
frame: len_z 7.4565e+02
frame: rgb 0.0000e+00 0.0000e+00 1.0000e+00
frame: visible ON
```

See Also:

- Associated annotation commands
- Associated frame commands
**Command:**

annotation: axis_model <toggle>

**Purpose:**

Turns the model axis triad on or off.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turn the triad on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turn the triad off</td>
</tr>
</tbody>
</table>

**Notes:**

The model axis' origin is fixed in the lower left corner of the viewport. It is intended to be a simple indicator of which way the X, Y, and Z axes lie.

**Example Usage:**

annotation: axis_model ON

**See Also:**

Associated annotation commands
Command:

    annotation: deselect_all

Purpose:

Deselects all annotations.

Parameters:

none

Example Usage:

    text: new_text A Test
    text: select_begin
    0
    text: select_end
    text: new_text A Second Test
    text: select_begin
    1
    text: select_end
    text: select_all
    text: select_begin
    0 1
    text: select_end
    annotation: deselect_all

See Also:

Associated annotation commands
**annotation: element_labeling**

**Command:**

```
annotation: element_labeling <toggle>
```

**Purpose:**

Turns element labels on or off globally.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turn labels on globally</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turn labels off globally</td>
</tr>
</tbody>
</table>

**Notes:**

Element labels for individual parts can be toggled on or off; however, for any labels to be visible, the global setting must be on. A threshold can also be enabled to limit the range of visible labels.

**Example Usage:**

```
annotation: element_labeling ON
view_transf: function global
part: select_partname_begin
  "(CASE:Case 1)Subset of parts: 2"
part: select_partname_end
part: modify_begin
part: entity_label_elt ON
part: modify_end
view_transf: function global
annot_entlbl: node_thresholds high
annot_entlbl: node_threshold_low 1
annot_entlbl: node_threshold_high 10
annot_entlbl: node_rgb 0.000000 0.000000 1.000000
```

**See Also:**

Associated annotation commands
Command:

    annotation: legend <toggle>

Purpose:

Toggles visibility of all visible legends.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>turn all visible legends on</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>turn all visible legends off</td>
</tr>
</tbody>
</table>

Example Usage:

    legend: select_palette_begin
    pressure
    legend: select_palette_end
    legend: visible ON
    legend: select_palette_begin
    velocity
    legend: select_palette_end
    legend: visible ON
    legend: select_palette_begin
    pressure
    legend: select_palette_end
    legend: select_palette_begin
    pressure
    legend: select_palette_end
    legend: location_x 3.2353e-01
    legend: location_y 5.3681e-02
    legend: select_palette_begin
    pressure
    legend: select_palette_end
    annotation: legend off

See Also:

Associated annotation commands
annotation: node_labeling

Command:

```
annotation: node_labeling <toggle>
```

Purpose:

Turns node labels on or off globally.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Node labels for individual parts can be toggled on or off; however, for any labels to be visible, the global setting must be on. A threshold can also be enabled to limit the range of visible labels.

Example Usage:

```
annotation: node_labeling ON
view_transf: function global
view_transf: function global
part: modify_begin
part: entity_label_node ON
part: modify_end
view_transf: function global
annot_entlbl: element_thresholds band
annot_entlbl: element_threshold_low 10
annot_entlbl: element_threshold_high 20
annot_entlbl: element_rgb 0.000000 1.000000 0.000000
```

See Also:

Associated [annotation](#) commands
Command:

    annotation: text_display <toggle>

Purpose:

Toggles the visibility of all text, line, and logo annotations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command does not affect the visibility of legends.

Example Usage:

    text: new_text My Test Data
    # turn off all annotations
    annotation: text_display OFF

See Also:

Associated annotation commands
Commands in this Section:

**boundarylayer**

- `boundarylayer: create_update`
- `boundarylayer: density <variable_name>`
- `boundarylayer: determine_velocity_by <option>`
- `boundarylayer: dynamic_viscosity <value>`
- `boundarylayer: freestream_density <density_value>`
- `boundarylayer: freestream_velocity <velocity_value>`
- `boundarylayer: modify_begin`
- `boundarylayer: modify_end`
- `boundarylayer: momentum <variable_name>`
- `boundarylayer: normal_distance <distance_value>`
- `boundarylayer: velocity <variable_name>`
- `boundarylayer: velocity_magnitude <velocity_value>`

**See Also:**

- User Manual - Section 7.22, Boundary Layer Variables Create/Update
- How To Extract Boundary Layer Variables
boundarylayer: create_update

Command:

```
boundarylayer: create_update
```

Purpose:

Specify to create or update the boundary-layer variables on the selected 2D part(s).

Parameters:

None.

Notes:

The following boundary-layer variables will be created or updated at the nodes of the selected 2D parts:

- `bl_thickness` - boundary-layer thickness
- `bl_displ_thickness` - displacement thickness
- `bl_momen_thickness` - momentum thickness
- `bl_shape_parameter` - shape parameter
- `bl_skin_friction_Cf` - skin-friction coefficient

Example Usage:

```
part: select_begin
  2
part: select_end
boundarylayer: create_update
```

See Also:

Associated `boundarylayer` commands
Command:

`boundarylayer: density <variable_name>`

Purpose:

Specify the density variable to use in creating/updating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td><code>variable_name</code></td>
<td>name of the density variable (the default name &quot;none&quot; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable gets assigned automatically if the variable name "Density" exists. Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```plaintext
boundarylayer: modify_begin
boundarylayer: density Density
boundarylayer: modify_end
```

See Also:

Associated boundarylayer commands
boundarylayer: determine_velocity_by

Command:

boundarylayer: determine_velocity_by <option>

Purpose:

Specify how to assign the velocity just outside the boundary layer in calculating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>(default) determines the velocity just outside the boundary layer to be determined via convergence criteria. That is, when either the velocity magnitude becomes constant or the gradient of the velocity magnitude approaches zero or becomes negative.</td>
</tr>
<tr>
<td></td>
<td>convergence_criteria</td>
<td></td>
</tr>
<tr>
<td>distance_from_surface</td>
<td></td>
<td>determines the velocity magnitude just outside the boundary layer for each node to be that velocity at a specified distance normal from the 2D surface</td>
</tr>
<tr>
<td>velocity_magnitude</td>
<td></td>
<td>determines the velocity magnitude just outside the boundary layer to be a specified velocity magnitude</td>
</tr>
</tbody>
</table>

Example Usage:

boundarylayer: determine_velocity_by distance_from_surface
boundarylayer: normal_distance 1.0000e-03
part: select_begin
  2
part: select_end
boundarylayer: create_update

See Also:

Associated boundarylayer commands
Command:

boundarylayer: dynamic_viscosity <value>

Purpose:

Specify the dynamic viscosity constant value or variable name to use in creating/updating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>value</td>
<td>the scalar field variable name for the dynamic viscosity</td>
</tr>
<tr>
<td>float</td>
<td>value</td>
<td>a constant value (default = 1.8300e-05) for the dynamic viscosity</td>
</tr>
</tbody>
</table>

Notes:

The <value> can be multiple types depending on variable definition. This variable is required to compute the fluid shear stress of the fluid for the skin-friction coefficient variable.

Example Usage:

boundarylayer: modify_begin
boundarylayer: dynamic_viscosity 1.8300e-05
boundarylayer: modify_end

See Also:

Associated boundarylayer commands
**boundarylayer: freestream_density**

**Command:**

```
boundarylayer: freestream_density <density_value>
```

**Purpose:**

Specify the freestream density constant value to use in creating/updating the boundary-layer variables.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>density_value</td>
<td>constant value (default = 1.) for the freestream density</td>
</tr>
</tbody>
</table>

**Notes:**

This variable is required to compute the skin-friction coefficient variable.

**Example Usage:**

```
boundarylayer: modify_begin
boundarylayer: freestream_density 9.0000e-01
boundarylayer: modify_end
```

**See Also:**

Associated `boundarylayer` commands
boundarylayer: freestream_velocity

Command:

```
boundarylayer: freestream_velocity <velocity_value>
```

Purpose:
Specify the freestream velocity constant value to use in creating/updating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>velocity_value</td>
<td>a constant value (default = 1.) for the freestream velocity</td>
</tr>
</tbody>
</table>

Notes:
This variable is required to compute the skin-friction coefficient variable.

Example Usage:

```
boundarylayer: modify_begin
boundarylayer: freestream_velocity 8.8500e-01
boundarylayer: modify_end
```

See Also:
Associated boundarylayer commands
boundarylayer: modify_begin/end

Command:

boundarylayer: modify_begin
<command>
boundarylayer: modify_end

Purpose:

Specify the execute construct within which to define a dependent variable used in computing the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>command</td>
<td>boundary layer variable command to define or update</td>
</tr>
</tbody>
</table>

Example Usage:

boundarylayer: modify_begin
boundarylayer: freestream_velocity 8.8500e-01
boundarylayer: modify_end

See Also:

Associated boundarylayer commands
Command:

```
boundarylayer: momentum <variable_name>
```

Purpose:

Specify the momentum variable to use in creating/updating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the momentum variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable gets assigned automatically if the variable name `<momentum>` exists. Since the computation of boundary-layer variables depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```
boundarylayer: modify_begin
boundarylayer: momentum none
boundarylayer: modify_end
```

See Also:

Associated `boundarylayer` commands
boundarylayer: normal_distance

Command:

```
boundarylayer: normal_distance <distance_value>
```

Purpose:

Specify the distance normal from the surface in which to determine the velocity just outside the boundary layer in order to compute the boundary-layer variables at each node on the surface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>distance_value</td>
<td>distance from the surface at which to compute the velocity just outside the boundary layer</td>
</tr>
</tbody>
</table>

Notes:

Only used for the `boundarylayer: determine_velocity_by distance_from_surface` option.

Example Usage:

```
boundarylayer: determine_velocity_by distance_from_surface
boundarylayer: normal_distance 1.0000e+00
part: select_begin
  2
part: select_end
boundarylayer: create_update
```

See Also:

Associated `boundarylayer` commands
Command:

\texttt{boundarylayer: velocity <variable_name>}

Purpose:

Specify the velocity variable to use in creating/updating the boundary-layer variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the velocity variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable gets assigned automatically if the variable name \texttt{<Velocity>} exists. Since the computation of boundary-layer variables depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

\begin{verbatim}
boundarylayer: modify_begin
boundarylayer: velocity Velocity
boundarylayer: modify_end
\end{verbatim}

See Also:

Associated \texttt{boundarylayer} commands
boundarylayer: velocity_magnitude

Command:

```
boundarylayer: velocity_magnitude <velocity_value>
```

Purpose:

Specify the velocity magnitude normal at which to determine the velocity just outside the boundary layer in order to compute the boundary-layer variables at each node on the surface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>velocity_value</td>
<td>velocity magnitude at which to assign the velocity just outside the boundary layer</td>
</tr>
</tbody>
</table>

Notes:

Only used for the `boundarylayer: determine_velocity_by distance_from_surface` option.

Example Usage:

```
boundarylayer: determine_velocity_by velocity_magnitude
boundarylayer: velocity_magnitude 1.0000e+00
part: select_begin
  2
part: select_end
boundarylayer: create_update
```

See Also:

Associated `boundarylayer` commands
Commands in this Section:

case

case: add <case_id>
case: apply_context <toggle>
case: create_viewport <toggle>
case: delete <case_id>
case: reflect_model_in <option>
case: reflect_model_origin <x_comp> <y_comp> <z_comp>
case: replace <old_value> <new_value>
case: select <case_id>
case: viewports <vp# vp# ... vp#>

See Also:

User Manual - Section 6.6, Case Menu Functions
How To Load Multiple Datasets (Cases)
case: add

Command:

    case: add <case_id>

Purpose:

    Add another case dataset to your current EnSight session.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>case_id</td>
<td>id of the new case (see Notes below)</td>
</tr>
</tbody>
</table>

Notes:

    By default the new case names are called "Case #" where the # is the next available case # - 1 based.

Example Usage:

    case: create_viewport ON
    case: apply_context OFF
    case: relfect_model_in 'none'
    case: add Case 2
    case: select Case 2
    viewport: select_begin
      1
    viewport: select_end

See Also:

    Associated case commands
Command:

```
case: apply_context <toggle>
```

Purpose:

Specify whether to apply context from the initial case when adding another new case.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to apply context</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF otherwise</td>
</tr>
</tbody>
</table>

Example Usage:

```
case: create_viewport ON
case: apply_context ON
case: reflect_model_in 'none'
case: add Case 2
case: select Case 2
viewport: select_begin
  1
viewport: select_end
```

See Also:

Associated `case` commands
case: create_viewport

Command:

    case: create_viewport <toggle>

Purpose:

Specify whether to create another viewport in which to display the new case when adding a new case.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to create another viewport</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF otherwise</td>
</tr>
</tbody>
</table>

Example Usage:

    case: create_viewport ON
    case: apply_context OFF
    case: reflect_model_in 'none'
    case: add Case 2
    case: select Case 2
    viewport: select_begin
           1
    viewport: select_end

See Also:

Associated case commands
Command:

    case: delete <case_id>

Purpose:

Delete the currently selected case dataset from your current EnSight session.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>case_id</td>
<td>id of the new case (see Notes below)</td>
</tr>
</tbody>
</table>

Notes:

By default the new case names are called "Case #" where the # is the next available case # - 1 based.

Example Usage:

```
#
# select case 2 for deletion
#
case: select 2
#
# delete case 2
#
case: delete 2
#
# select case 1 as current, or default
#
case: select 1
```

See Also:

Associated case commands
Command:

    case: reflect_model_in <option>

Purpose:

Specify whether to apply a mirror transform when adding a new case.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>option</td>
<td>Includes the following options:</td>
</tr>
<tr>
<td></td>
<td>'none'</td>
<td>no reflection (default)</td>
</tr>
<tr>
<td></td>
<td>'X'</td>
<td>reflect model about the x axis</td>
</tr>
<tr>
<td></td>
<td>'Y'</td>
<td>reflect model about the y axis</td>
</tr>
<tr>
<td></td>
<td>'Z'</td>
<td>reflect model about the z axis</td>
</tr>
<tr>
<td></td>
<td>'X'&gt;'Y'</td>
<td>or any combination of 'X', 'Y', 'Z'.</td>
</tr>
</tbody>
</table>

Notes:

The reflection transform occurs about the point specifies via the "reflect_model_origin" command.

Example Usage:

    case: create_viewport ON
    case: apply_context OFF
    case: reflect_model_in 'Z'
    case: add Case 2
    case: select Case 2
    viewport: select_begin
    1
    viewport: select_end

See Also:

Associated case commands
case: reflect_model_origin

Command:

    case: reflect_model_origin  <x_comp>  <y_comp>  <z_comp>

Purpose:

Specify the model origin about which to reflect the newly added case

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x component of the origin (in model coordinates) about which to reflect the new case dataset</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td>y component of the origin (in model coordinates) about which to reflect the new case dataset</td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td>z component of the origin (in model coordinates) about which to reflect the new case dataset</td>
</tr>
</tbody>
</table>

Notes:

Default origin is 0., 0., 0.

Used with the "reflect_model_in" command.

Example Usage:

    case: create_viewport ON
    case: apply_context OFF
    case: reflect_model_in 'X'
    case: reflect_model_in 1.0000e+00 0.0000e+00 0.0000e+00
    case: add Case 2
    case: select Case 2
    viewport: select_begin
    1
    viewport: select_end

See Also:

Associated case commands
case: replace

Command:

    case: replace <old_value> <new_value>

Purpose:

Replace the current selected case dataset with another case dataset.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>old_value</td>
<td>name of the case to be replaced</td>
</tr>
<tr>
<td></td>
<td>new_value</td>
<td>name (id) of the case replacing the old string value</td>
</tr>
</tbody>
</table>

Notes:

By default the new case names are called "Case #" where the # is the next available case # - 1 based.

Example Usage:

```
#  # select 2nd case
#  case: select Case 2
#  # replace 2nd case w/2nd case
#  case: replace 'Case 2'
#  # select 2nd case 'Case 2'
#  case: select Case 2

or

#  # select 2nd case
#  case: select Case 2
#  # replace 2nd case w/3rd case
#  case: replace 'Case 2' 'Case 3'
#  # select 2nd case
#  case: select Case 3
```

See Also:

Associated case commands
Command:

```plaintext
case: select <case_id>
```

Purpose:

Specify current (active) case.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>case_id</td>
<td>id of the active case</td>
</tr>
</tbody>
</table>

Notes:

Many operations depend on the active case, such as dataset queries.

Example Usage:

```plaintext
case: select Case 2
```

See Also:

Associated `case` commands
case: viewports

Command:

    case: viewports <vp# vp# ... vp#>

Purpose:

Specify which viewport in which to display the data from a case.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>vp#</td>
<td>viewport integer # in I[1,N] which correspond to the respective viewports in which case data is to be displayed. N is the number of active viewports.</td>
</tr>
</tbody>
</table>

Notes:

The active case is modified (see “case: select”).

Example Usage:

```plaintext
# Preliminary setup (for reference) - given two viewports
viewport: select_begin
0
viewport: select_end
view_transf: function global
viewport: viewport_layout two_horizontal
viewport: select_begin
1
viewport: select_end
#
# Displaying a case in both viewports
# case: viewports 1 2
#
# Displaying a case in only the first viewport
case viewports 1
```

See Also:

Associated case commands
Commands in this Section:

clip

clip: angle <cone_angle>
clip: axis <x_comp> <y_comp> <z_comp>
clip: begin
clip: end
clip: box_axis <axis> <x_vector> <y_vector> <z_vector>
clip: box_length <x_len> <y_len> <z_len>
clip: box_min <xmin> <ymin> <zmin>
clip: box_max <xmax> <ymax> <zmax>
clip: box_origin <x_ori> <y_ori> <z_ori>
clip: create
clip: delta <dx> <dy> <dz>
clip: dimension2 <min> <max>
clip: dimension3 <min> <max>
clip: dimension2_step <step>
clip: dimension3_step <step>
clip: domain <domain>
clip: general_equation <A> <B> <C> <D> <E> <F> <G> <H> <I> <J>
clip: grid_pts <x_pts> <y_pts>
clip: ijk_axis <toggle>
clip: ijk_axis_scale <scale>
clip: interactive_type <type>
clip: line <end> <x_coord> <y_coord> <z_coord>
clip: mesh_plane <plane>
clip: origin <x_coord> <y_coord> <z_coord>
clip: plane <corner> <x_coord> <y_coord> <z_coord>
clip: plane_extents <extent>
clip: plane_type <type>
clip: point <pt_num> <location> <radius>
clip: pts_on_line <line_pts>
clip: radius <value>
clip: revolution_points <number>
clip: revolve_part <part_id>
clip: revolve_partbyname <part_name>
clip: rtz_axis <toggle>
clip: select_default
clip: slider_range_ijk <beg_ijk> <end_ijk>
clip: slider_step_ijk <step_increment>
clip: slider_step_ijk <step_increment>
clip: slider_x <min_value> <max_value>
clip: slider_y <min_value> <max_value>
clip: slider_z <min_value> <max_value>
clip: tool <tool_type>
clip: value <plane_value>
clip: x_min_infinite <toggle>
clip: y_min_infinite <toggle>
clip: z_min_infinite <toggle>
clip

clip: x_max_infinite <toggle>
clip: y_max_infinite <toggle>
clip: z_max_infinite <toggle>

See Also:

User Manual - Section 7.5, Clip Create/Update
How To Create Clips
How To Cut Parts
Command:

```
clip: angle <cone_angle>
```

Purpose:

Set the angle for a cone clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>cone_angle</td>
<td>the cone angle in degrees</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Select the parent part
# part: select_begin
1
part: select_end
clip: begin
clip: domain intersect
clip: tool cone
clip: origin 0 0 0
clip: axis 1 0 0
#
# Set the cone to 20 degrees
#
clip: angle 20.
clip: end
clip: create
```

See Also:

Associated `clip` commands
clip: axis

Command:

```
clip: axis <x_comp> <y_comp> <z_comp>
```

Purpose:

Set the direction vector for quadric and revolution clips.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z components of the direction vector</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The origin together with the axis defines the location and orientation of the quadric and revolution tools.

The origin and axis define the point and axis about which a 1D part is revolved.

Example Usage:

```
# Select the parent part
#
part: select_begin
1
part: select_end
clip: begin
clip: domain intersect
clip: tool cylinder
clip: origin 0 0 0
#
# Set the cone axis to lie along the x axis
#
clip: axis 1 0 0
clip: radius .5
clip: end
clip: create
```

See Also:

Associated clip commands
Command:

```
clip: begin
clip: end
```

Purpose:
Delimit the modifications for clip attributes.

Parameters:
none

Notes:
These commands are used to set the attributes for a clip part creation.

Example Usage:

```
clip: begin
#  # Change attributes
#  clip: domain inside
clip: tool plane
clip: plane 1 -1 -1 0
clip: plane 2 1 -1 0
clip: plane 3 1 1 0
#  # End change attributes
#  clip: end
clip: create
```

See Also:
Associated `clip` commands
clip: box_axis

Command:

    clip: box_axis <axis> <x_vector> <y_vector> <z_vector>

Purpose:

Specify the direction vectors for a box clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>x specifies which axis is being defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z</td>
</tr>
<tr>
<td>float</td>
<td>x_vector</td>
<td>The x component of the direction vector</td>
</tr>
<tr>
<td></td>
<td>y_vector</td>
<td>The y component of the direction vector</td>
</tr>
<tr>
<td></td>
<td>z_vector</td>
<td>The z component of the direction vector</td>
</tr>
</tbody>
</table>

Notes:

The direction vectors are in reference to the parent part’s frame.

Example Usage:

#  
# Select a parent part  
#  
part: select_begin  
2  
part: select_end  
clip: begin  
#  
# Create a xyz box clip with the box aligned with the  
# global axis system and with an origin -.75, -.75, -.25  
# The box sides are of length 1., 1.5, 2.  
#  
# clip: tool xyz_box  
clip: box_origin -7.500000e-01 -7.500000e-01 -2.500000e-01  
clip: box_axis x 1.000000e+00 0.000000e+00 0.000000e+00  
clip: box_axis y 0.000000e+00 1.000000e+00 0.000000e+00  
clip: box_axis z 0.000000e+00 0.000000e+00 1.000000e+00  
clip: box_length 1.000000e+00 1.500000e+00 2.000000e+00  
clip: domain intersect  
clip: end  
clip: create

See Also:

Associated clip commands
Command:

\texttt{clip: box\_length \textless x\_len \textgreater \textless y\_len \textgreater \textless z\_len \textgreater}

Purpose:

Specify the size of the box clip in the x, y, and z directions

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>\textit{x_len}</td>
<td>The length of box clip in the x direction</td>
</tr>
<tr>
<td></td>
<td>\textit{y_len}</td>
<td>The length of box clip in the y direction</td>
</tr>
<tr>
<td></td>
<td>\textit{z_len}</td>
<td>The length of box clip in the z direction</td>
</tr>
</tbody>
</table>

Notes:

The lengths are in relation to the box axis directions.

Example Usage:

```
# Select a parent part
#
part: select\_begin
  2
part: select\_end
clip: begin
#
# Create a xyz box clip with the box aligned with the
# global axis system and with an origin -.75, -.75, -.25
# The box sides are of length 1., 1.5, 2.
#
clip: tool xyz\_box
clip: box\_origin -7.500000e-01 -7.500000e-01 -2.500000e-01
clip: box\_axis x 1.000000e+00 0.000000e+00 0.000000e+00
clip: box\_axis y 0.000000e+00 1.000000e+00 0.000000e+00
clip: box\_axis z 0.000000e+00 0.000000e+00 1.000000e+00
clip: box\_length 1.000000e+00 1.500000e+00 2.000000e+00
clip: domain intersect
clip: end
clip: create
```

See Also:

Associated \texttt{clip} commands
**clip: box_min/max**

**Command:**

\[
\begin{align*}
\text{clip: box_min} & \ <x_{\text{min}}> <y_{\text{min}}> <z_{\text{min}}> \\
\text{clip: box_max} & \ <x_{\text{max}}> <y_{\text{max}}> <z_{\text{max}}> \\
\end{align*}
\]

**Purpose:**

set the bounds for the XYZ Box extraction.

*(Note, these commands are no longer in use as of EnSight7.6)*

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>xmin</td>
<td>minimum X value for extract</td>
</tr>
<tr>
<td></td>
<td>ymin</td>
<td>minimum Y value for extract</td>
</tr>
<tr>
<td></td>
<td>zmin</td>
<td>minimum Z value for extract</td>
</tr>
<tr>
<td></td>
<td>xmax</td>
<td>maximum X value for extract</td>
</tr>
<tr>
<td></td>
<td>ymax</td>
<td>maximum Y value for extract</td>
</tr>
<tr>
<td></td>
<td>zmax</td>
<td>maximum Z value for extract</td>
</tr>
</tbody>
</table>

**Notes:**

The X/Y/Z min/max values are used only in the cases that the \(x/y/z_{\text{min/max\_infinite}}\) toggles are set off.

**Example Usage:**

```
# Select an existing clip part
# part: select_begin
3
part: select_end
part: modify_begin
clip: tool xyz_box
clip: y_max_infinite OFF
#
# Set the minimum box elements
#
clip: box_min -1 -1 -1
part: modify_end
```

**See Also:**

Associated `clip` commands
Command:

```
clip: box_origin <x_ori> <y_ori> <z_ori>
```

Purpose:

Specify the origin of the box clip in reference to the parent part's frame

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_ori</td>
<td>The x-origin of the box clip</td>
</tr>
<tr>
<td></td>
<td>y_ori</td>
<td>The y-origin of the box clip</td>
</tr>
<tr>
<td></td>
<td>z_ori</td>
<td>The z-origin of the box clip</td>
</tr>
</tbody>
</table>

Notes:

The origin is in reference to the parent part's frame.

Example Usage:

```
# Select a parent part
# part: select_begin
  2
part: select_end
clip: begin
  # Create a xyz box clip with the box aligned with the
global axis system and with an origin -.75, -.75, -.25
  # The box sides are of length 1., 1.5, 2.
  #
  clip: tool xyz_box
  clip: box_origin -7.500000e-01 -7.500000e-01 -2.500000e-01
  clip: box_axis x 1.000000e+00 0.000000e+00 0.000000e+00
  clip: box_axis y 0.000000e+00 1.000000e+00 0.000000e+00
  clip: box_axis z 0.000000e+00 0.000000e+00 1.000000e+00
  clip: box_length 1.000000e+00 1.500000e+00 2.000000e+00
  clip: domain intersect
  clip: end
  clip: create
```

See Also:

Associated `clip` commands
clip: create

Command:

        clip: create

Purpose:

Create a clip part with the currently defined attributes using the currently selected parts as parents.

Parameters:

        none

Notes:

The clip part is created using the currently selected parts as parents. The clip part is created using the currently set clip attributes.

Example Usage:

        #
        # Select a parent part
        #
        part: select_begin
        2
        part: select_end
        clip: begin
        clip: domain inside
        clip: tool cylinder
        clip: origin -1. 0 1.
        clip: axis 1 0 0
        clip: radius .75
        clip: end
        clip: create

See Also:

Associated clip commands
Command:

    clip: delta <dx> <dy> <dz>

Purpose:

Set a delta transform for use with the keyframe animator.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>dx</td>
<td>amount to translate in x direction for each animation frame</td>
</tr>
<tr>
<td></td>
<td>dy</td>
<td>amount to translate in y direction for each animation frame</td>
</tr>
<tr>
<td></td>
<td>dz</td>
<td>amount to translate in z direction for each animation frame</td>
</tr>
</tbody>
</table>

Notes:

Applies only to line and plane clip types.

Example Usage:

```en
# Select an existing clip part
# part: select_begin
  3
part_select_end
part: modify_begin
# Increment the clip position by 0.2 in the x-direction
# clip: delta .2 0 0
part: modify_end
anim_keyframe: keyframing ON
anim_keyframe: create_keyframe
anim_keyframe: create_keyframe
anim_keyframe: run
```

See Also:

Associated clip commands
Command:

```
clip: dimension2 <min> <max>
clip: dimension3 <min> <max>
```

Purpose:

Specify the minimum/maximum range for the non-constant I/J/K extract.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>min</td>
<td>minimum plane value integer</td>
</tr>
<tr>
<td></td>
<td>max</td>
<td>maximum plane value integer</td>
</tr>
</tbody>
</table>

Notes:

For an I/J/K extract the user specifies that he wants to create a part of constant I, J, or K and an extract value. These parameters specify the range for the non-constant plane.

Example Usage:

```
# Select an existing I plane
# extract an modify the J range = 10 to 60
# and the K range to be 1 to 45
#
p: select_begin
  3
p: select_end
p: modify_begin
clip: dimension2 10 60
clip: dimension3 1 45
p: modify_end
```

See Also:

Associated `clip` commands
Command:

clip: dimension2_step <step>
clip: dimension3_step <step>

Purpose:

Specify the step increment for the non-constant I/J/K extract.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step</td>
<td>step value</td>
</tr>
</tbody>
</table>

Notes:

For an I/J/K extract the user specifies that he wants to create a part of constant I, J, or K and a extract value. These parameters specify the step increment for the non-constant plane.

Example Usage:

```plaintext
# Select an existing I plane extract
# and modify the J step by factor
# to 2

part: select_begin
  3
part: select_end
part: modify_begin
clip: dimension2 10 60
clip: dimension2_step 2
clip: dimension3 1 45
part: modify_end
```

See Also:

Associated `clip` commands
**Command:**

```
clip: domain <domain>
```

**Purpose:**

Specify what type of clip will be created.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>domain</td>
<td>intersect to create a part which is the intersection between the clip tool and the parent parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>inside to create a part which contains the geometry (including intersected elements) in the positive half space of the clip tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>outside to create a part which contains the geometry (including intersected elements) in the negative half space of the clip tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>in_out to create two parts - one for the inside and one for the outside half spaces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>crinkly to create a part which contains the geometry of the elements which intersect the clip tool</td>
</tr>
</tbody>
</table>

**Notes:**

*Intersect* applies to all tools except XYZ Box.

*Inside/outside/in_out* apply to all tools except XYZ, IJK, and Line.

When domain is set to *inside/outside/in_out* the parent parts will be made invisible.

The default is *intersect*.

**Example Usage:**

```plaintext
# 
# Select the part
#
part: select_begin
2
part: select_end
clip: begin
# 
# Create a new part inside the
# cylinder tool
#
clip: domain inside
clip: tool cylinder
clip: origin -1. 0 1.
clip: axis 1 0 0
clip: radius .75
clip: end
clip: create
```

**See Also:**

Associated *clip* commands
**Command:**

```en
clip: general_equation <A> <B> <C> <D> <E> <F> <G> <H> <I> <J>
```

**Purpose:**

Clip to a specified quadric equation of the form

\[ Ax^2 + By^2 + Cz^2 + Dxy + Eyz + Fxz + Gx + Hy + Iz = J \]

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>A</td>
<td>The coefficient of the x^2 term</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>The coefficient of the y^2 term</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>The coefficient of the z^2 term</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>The coefficient of the xy term</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>The coefficient of the yz term</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>The coefficient of the xz term</td>
</tr>
<tr>
<td></td>
<td>G</td>
<td>The coefficient of the x term</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>The coefficient of the y term</td>
</tr>
<tr>
<td></td>
<td>I</td>
<td>The coefficient of the z term</td>
</tr>
<tr>
<td></td>
<td>J</td>
<td>The constant term</td>
</tr>
</tbody>
</table>

**Example Usage:**

```en
# Select the parent part
part: select_begin
1
part: select_end
clip: begin
# Create a clip of the form
# x^2 + y^2 + z^2 = .5
#
clip: domain intersect
clip: tool general_quadric
clip: general_equation 1 1 1 0 0 0 0 0 0 .5
clip: end
clip: create
```

**See Also:**

Associated clip commands
clip: grid_pts

Command:

`clip: grid_pts <x_pts> <y_pts>`

Purpose:

Set the number of sample points for a planar grid clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>x_pts</td>
<td>number of points to sample along the x plane tool direction</td>
</tr>
<tr>
<td></td>
<td>y_pts</td>
<td>number of points to sample along the y plane tool direction</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Modify an existing grid clip part
# part: select_begin
  3
part: select_end
part: modify_begin
clip: grid_pts 10 12
part: modify_end
```

See Also:

Associated `clip` commands
Command:

\texttt{clip: ijk\_axis <toggle>}

Purpose:

Display an axis system for a IJK extract.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to show the axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for no axis</td>
</tr>
</tbody>
</table>

Notes:

Is only valid for I/J/K plane clips.

Example Usage:

```plaintext
# Turn on an axis showing the
# IJK layout of an existing
# clip part
#
part: select\_begin
  3
part: select\_end
part: modify\_begin
clip: ijk\_axis ON
clip: ijk\_axis\_scale 1.5
part: modify\_end
```

See Also:

Associated \texttt{clip} commands
**clip: ijk_axis_scale**

**Command:**

```
clip: ijk_axis_scale <scale>
```

**Purpose:**

Specify the length of the IJK axis for IJK extracts.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale</td>
<td>length of the axis in world coordinates</td>
</tr>
</tbody>
</table>

**Notes:**

Is only valid for I/J/K plane clips.

**Example Usage:**

```
part: select_begin
  3
part: select_end
part: modify_begin
clip: ijk_axis ON
clip: ijk_axis_scale 1.5
part: modify_end
```

**See Also:**

Associated `clip` commands
Command:

\texttt{clip: interactive\_type \textless type\textgreater}

Purpose:

Specify the interactive setting for a clip part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>off</td>
</tr>
<tr>
<td>manual</td>
<td></td>
<td></td>
</tr>
<tr>
<td>auto</td>
<td></td>
<td></td>
</tr>
<tr>
<td>auto_cycle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The min and max values are constrained via the \texttt{slider\_range\_ijk} commands.

Example Usage:

\begin{verbatim}
part: select_begin
  2
part: select_end
isos: interactive\_type auto
\end{verbatim}

See Also:

Associated \texttt{clip} commands
**clip: line**

**Command:**

```
clip: line <end> <x_coord> <y_coord> <z_coord>
```

**Purpose:**

Set an end point for a clip line.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>end</td>
<td>1 or 2, to set specified line end point</td>
</tr>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x coordinate of end point</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td>y coordinate of end point</td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td>z coordinate of end point</td>
</tr>
</tbody>
</table>

**Notes:**

Two end points are necessary to properly define the line location.

**Example Usage:**

```
#
# Select a parent part
#
part: select_begin
  2
part: select_end
clip: begin
#
# Create a line clip from
# {-1, -1, 0} to {1, -1, 0} with
# 25 evenly spaced points
#
clip: tool line
clip: pts_on_line 25
clip: line 1 -1 -1 0
clip: line 2 1 -1 0
clip: end
clip: create
```

**See Also:**

Associated clip commands
Command:

\texttt{clip: mesh\_plane <plane>}

Purpose:

Set the plane for XYZ or IJK clips

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>plane</td>
<td>X - Clip of constant X</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y - Clip of constant Y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Z - Clip of constant Z</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I - Clip of constant I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>J - Clip of constant J</td>
</tr>
<tr>
<td></td>
<td></td>
<td>K - Clip of constant K</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R - Clip of constant radius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>T - Clip of constant theta angle (in degrees)</td>
</tr>
</tbody>
</table>

Notes:

IJK clips can only be created on block structured parts.

Example Usage:

```
# Select a parent part
# part: select\_begin
  2
part: select\_end
clip: begin
  #
  # Create a clip at y=1.5
  #
  clip: value 1.5
  clip: domain intersect
  clip: tool xyz
  clip: mesh\_plane Y
  clip: end
clip: create
```

See Also:

Associated \texttt{clip} commands
**clip: origin**

**Command:**

`clip: origin <x_coord> <y_coord> <z_coord>`

**Purpose:**

Set origin for quadric and revolution clips.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of origin</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

The origin together with the axis defines the location and orientation of the quadric and revolution tools.

The origin and axis define the point and axis about which a 1D part is revolved.

**Example Usage:**

```plaintext
# Select the parent part
# part: select_begin
1
part: select_end
clip: begin
#
# Create a cylinder clip
# defined by the origin at {0. 0. 0}
# a direction vector of {1, 0, 0}
# and a radius of 0.5
#
clip: domain intersect
clip: tool cylinder
clip: origin 0 0 0
clip: axis 1 0 0
clip: radius .5
clip: end
clip: create
```

**See Also:**

Associated `clip` commands
**Command:**

```
clip: plane <corner> <x_coord> <y_coord> <z_coord>
```

**Purpose:**

Set a corner for a clip plane.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>corner</td>
<td>1, 2 or 3, to set specified plane corner</td>
</tr>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of corner</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Three corners are necessary to properly define the plane location.

**Example Usage:**

```
#
# Select the parent part
#
part: select_begin
  2
part: select_end
clip: begin
#
# Create a finite clip plane
# with corners as defined
#
clip: tool plane
clip: plane_extents finite
clip: plane 1 -1 -1 0
clip: plane 2 1 -1 0
clip: plane 3 1 1 0
clip: end
clip: create
```

**See Also:**

Associated `clip` commands
Command:

```
clip: plane_extents <extent>
```

Purpose:
Set the extents to infinite or finite for a plane clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>extent</td>
<td><strong>finite</strong> to create a clip plane which is bound by the plane tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>infinite</strong> to create an infinite clip in the plane of the plane tool</td>
</tr>
</tbody>
</table>

Notes:
For planes that are clipped using a grid `plane_type` the extents are always finite.
The default is `infinite` (except grid clips which are `finite`).
Quadric clips are always `infinite`.

Example Usage:
```
#
# Select the parent part
#
part: select_begin
  2
part: select_end
clip: begin
  #
  # Create a finite clip plane
  # with bounds as defined
  #
  clip: tool plane
  clip: domain intersect
  clip: plane_extents finite
  clip: plane 1 -1 -1 0
  clip: plane 2 1 -1 0
  clip: plane 3 1 1 0
  clip: end
clip: create
```

See Also:
Associated clip commands
Command:

```
clip: plane_type <type>
```

Purpose:

For a clip using the plane tool specifies that a true cross-section (mesh) should be created or a uniform sample (grid).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>mesh: (default) to create a true cross-section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>grid: to sample along the x and y plane directions</td>
</tr>
</tbody>
</table>

Notes:

Applies only to clips created with the plane tool.

Grid clips are by definition finite in nature.

Example Usage:

```#
# Select the parent part
# part: select_begin
2
part: select_end
clip: begin
clip: tool plane
clip: domain intersect
clip: plane_type mesh
clip: plane 1 -1 -1 0
clip: plane 2 1 -1 0
clip: plane 3 1 1 0
clip: end
clip: create
```

See Also:

Associated `clip` commands
clip: point

Command:

```
clip: point <pt_num> <location> <radius>
```

Purpose:

Defines points for the surface of revolution.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>pt_num</td>
<td>point number</td>
</tr>
<tr>
<td></td>
<td>location</td>
<td>location along the line</td>
</tr>
<tr>
<td></td>
<td>radius</td>
<td>radius at the point location</td>
</tr>
</tbody>
</table>

Notes:

There can be at most 10 points in the surface of revolution.

Is only used when "clip: tool" is set to "revolution".

Example Usage:

```
#  # Select the parent part
#  part: select_begin
2
part: select_end
clip: begin

#  # Create a clip using a tool
#  # of revolution with origin at
#  # {.5, .5, 0} and lined up with
#  # the x-axis
#  clip: domain intersect
clip: revolution_points 5
clip: tool revolution
clip: origin .5 .5 0
clip: axis 1 0 0
clip: point 1 -1 .5
clip: point 2 0 .7
clip: point 3 1 .5
clip: end
clip: create
```

See Also:

Associated clip commands
Command:

\[\text{clip: pts\_on\_line <line\_pts>}\]

Purpose:

Set the number of sample points for a line clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>line_pts</td>
<td>number of linearly spaced sample points for the line clip</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select an existing line clip
# and set the number of
# sample points to 20
#
part: select\_begin
  3
part: select\_end
part: modify\_begin
clip: pts\_on\_line 20
part: modify\_end
```

See Also:

Associated clip commands
clip: radius

Command:

    clip: radius <value>

Purpose:

Set the radius for a sphere or cylinder clip.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>radius for the sphere or cylinder clip</td>
</tr>
</tbody>
</table>

Example Usage:

    #
    # Select the parent part
    #
    part: select_begin
    1
    part: select_end
    clip: begin
    #
    # Create a cylinder clip of
    # radius=0.5 with origin and
    # axis as shown
    #
    clip: domain intersect
    clip: tool cylinder
    clip: origin 0 0 0
    clip: axis 1 0 0
    clip: radius .5
    clip: end
    clip: create

See Also:

Associated clip commands
Command:

```
clip: revolution_points <number>
```

Purpose:

Set the number of points used in the tool of revolution for clipping.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>number</td>
<td>number of points used for the revolution tool</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select the parent part
part: select_begin
2
part: select_end
clip: begin
#
# Create a clip of revolution
# with five defined points
#
clip: domain intersect
clip: revolution_points 5.0000e+00
clip: tool revolution
clip: origin 5.0000e-01 5.0000e-01 1.0000e+00
clip: axis 1.0000e+00 0.0000e+00 0.0000e+00
clip: point 1 -1.2500e+00 5.0000e-01
clip: point 2 -6.2500e-01 5.0000e-01
clip: point 3 0.0000e+00 1.0000e+00
clip: point 4 6.2500e-01 5.0000e-01
clip: point 5 1.2500e+00 5.0000e-01
clip: end
clip: create
```

See Also:

Associated `clip` commands
clip: revolve_part

Command:

\texttt{clip: revolve\_part <part\_id>}

Purpose:

Clip by revolving a 1D part about an axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_id</td>
<td>part ID number to revolve</td>
</tr>
</tbody>
</table>

Notes:

The end points for the 1D part are effectively extended to infinity during the clip.

The part is revolved around the defined origin and axis.

Example Usage:

```
# Select an existing clip part
# part: select\_begin
  3
part: select\_end
part: modify\_begin
#
# Revolve 1D part 4
# about an axis
#
clip: tool 1d\_part
clip: revolve\_part 4
clip: origin -2.4838e-01 -2.3340e-01 1.8757e+00
clip: axis 0.0000e+00 1.0000e+00 0.0000e+00
part: modify\_end
```

See Also:

Associated clip commands
Command:

```plaintext
clip: revolve_partbyname <part_name>
```

Purpose:

Clip by revolving a 1D part about an axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>part_name</td>
<td>part name to revolve</td>
</tr>
</tbody>
</table>

Notes:

This command is functionally the same as "clip: revolve_part" except it takes a part name as the argument instead of a part id.

The end points for the 1D part are effectively extended to infinity during the clip.

The part is revolved around the defined origin and axis.

Example Usage:

```plaintext
#
# Select an existing clip part
#
part: select_begin
  3
part: select_end
part: modify_begin
#
# Revolve part "clip line" about an axis
#
clip: tool 1d_part
clip: revolve_part clip line
clip: origin -2.4838e-01 -2.3340e-01 1.8757e+00
clip: axis 0.0000e+00 1.0000e+00 0.0000e+00
part: modify_end
```

See Also:

Associated clip commands
clip: rtz_axis

Command:

clip: rtz_axis <toggle>

Purpose:

Specify the axis to be used for RTZ clips. Theta is about this axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>X The x frame axis defines the RTZ system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Y The y frame axis defines the RTZ system.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Z The z frame axis defines the RTZ system.</td>
</tr>
</tbody>
</table>

Notes:

The axis is in reference to the frame associated with the parent part(s).

Example Usage:

```plaintext
# Select a parent part
#
part: select_begin
  2
part: select_end
clip: begin
  # Create a Z RTZ clip about the Z axis at Z=0.
  #
  clip: tool rtz
  clip: rtz_axis Z
  clip: value 0.
  clip: domain intersect
  clip: mesh_plane Z
  clip: end
clip: create
```

See Also:

Associated clip commands
Command:

clip: select_default

Purpose:

Sets the target to the default settings for subsequent attribute modifications.

Parameters:

none

Example Usage:

```bash
# Set the default clip tool to cylinder
#
clip: select_default
part: modify_begin
clip: tool cylinder
part: modify_end
```

See Also:

Associated clip commands
Command:

\texttt{clip: slider\_range\_ijk <beg\_ijk> <end\_ijk>}

Purpose:

Set the I, J, or K range through which an IJK clip part will be modified when in interactive mode, whether using the slider in Manual mode or in Auto or Auto Cycle mode.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>\beg_ijk</td>
<td>begining I, J, or K plane of range.</td>
</tr>
<tr>
<td>int</td>
<td>\end_ijk</td>
<td>ending I, J, or K plane of range.</td>
</tr>
</tbody>
</table>

Notes:

Is only used for interactive clips.

Example Usage:

```plaintext
#
# Set the slider ijk range for an
# existing IJK clip plane to be within 5 and 35
#
part: select\_begin
  2
part: select\_end
part: modify\_begin
clip: tool ijk
clip: slider\_range\_ijk 5 35
part: modify\_end
```

See Also:

Associated \texttt{clip} commands
Command:

```
clip: slider_step <step_increment>
```

Purpose:

Set the value that a X/Y/Z clip part is modified when in interactive mode and the user interface less/greater buttons are selected.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>step_increment</td>
<td>step increment of slider</td>
</tr>
</tbody>
</table>

Notes:

A negative step value is used when the less button is selected while a positive step value is used when the greater button is selected.

Is only used for interactive clips.

Example Usage:

```
# Set the step increment for an existing clip plane to 1.0
#
part: select_begin
  3
part: select_end
part: modify_begin
clip: tool xyz
clip: slider_step 1.0
part: modify_end
```

See Also:

Associated `clip` commands
**clip: slider_step_ijk**

**Command:**

\[
\text{clip: slider_step_ijk <step_increment>}
\]

**Purpose:**

Set the value that an IJK clip part is modified when in interactive mode and the user interface less/greater buttons are selected.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_increment</td>
<td>step increment of slider</td>
</tr>
</tbody>
</table>

**Notes:**

A negative step value is used when the less button is selected while a positive step value is used when the greater button is selected.

Is only used for interactive clips.

**Example Usage:**

```
#
# Set the step increment for an
# existing IJK clip plane to 3
#
part: select_begin
  2
part: select_end
part: modify_begin
clip: tool ijk
clip: slider_step_ijk 3
part: modify_end
```

**See Also:**

Associated clip commands
Command:

\[
\text{clip: slider}_x \ <\text{min}\_value> \ <\text{max}\_value> \\
\text{clip: slider}_y \ <\text{min}\_value> \ <\text{max}\_value> \\
\text{clip: slider}_z \ <\text{min}\_value> \ <\text{max}\_value>
\]

Purpose:

Set the min/max X/Y/Z extents in the user interface for a clip of constant X/Y/Z.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min_value</td>
<td>minimum slider value</td>
</tr>
<tr>
<td></td>
<td>max_value</td>
<td>maximum slider value</td>
</tr>
</tbody>
</table>

Notes:

Is only used for interactive clips.

Example Usage:

```
# Set the min/max slider value for
# a clip of constant X
#
part: select_begin
  3
part: select_end
part: modify_begin
clip: slider_x -1 4
part: modify_end
```

See Also:

Associated clip commands
**clip: tool**

**Command:**

\[ \text{clip: tool } <\text{tool\_type}> \]

**Purpose:**

Set the clipping tool.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>tool_type</td>
<td>1d_part Clip by rotating a 1D part about an axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cone Clip using a cone</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cylinder Clip using a cylinder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>general_quadric Clip by specifying a quadric equation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ijk Extract a constant I, J, or K plane from a block structured part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>line Create a line with linearly spaced sample points</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plane Clip using a plane</td>
</tr>
<tr>
<td></td>
<td></td>
<td>revolution Clip by a tool of revolution</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rtz Clip to a constant radial, theta, or z coordinate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sphere Clip using a sphere</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xyz Clip to a constant x, y, or z coordinate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xyz_box Cut to the boundary of a box</td>
</tr>
</tbody>
</table>

**Notes:**

ijk extract can only occur using a single parent part.

**Example Usage:**

```
# Select the parent part
#
part: select_begin
  2
part: select_end
clip: begin
clip: domain inside
clip: tool cylinder
clip: origin -1. 0 1.
clip: axis 1 0 0
clip: radius .75
clip: end
clip: create
```

**See Also:**

Associated clip commands
Command:

clip: value <plane_value>

Purpose:

Specify the constant plane value for XYZ or IJK clips.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>plane_value</td>
<td>value for the plane</td>
</tr>
</tbody>
</table>

Notes:

For IJK clips the `plane_value` must be an integer.

Example Usage:

```plaintext
# Select the parent part
# part: select_begin
  2
part: select_end
clip: begin
  # Create a clip of y=1.5
  # clip: value 1.5
  clip: domain intersect
  clip: tool xyz
  clip: mesh_plane Y
  clip: end
clip: create
```

See Also:

Associated clip commands
**Command:**

```plaintext
clip: x_min_infinite <toggle>
clip: y_min_infinite <toggle>
clip: z_min_infinite <toggle>
clip: x_max_infinite <toggle>
clip: y_max_infinite <toggle>
clip: z_max_infinite <toggle>
```

**Purpose:**

Specify if the x/y/z min/max bounds of a xyz_box clip is infinite.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON for infinite bound</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for finite bound</td>
</tr>
</tbody>
</table>

**Notes:**

If finite bound the value is taken from the "clip: box_min/max" command.

**Example Usage:**

```plaintext
# Select an existing box clip
#
part: select_begin
3
part: select_end
part: modify_begin
clip: tool xyz_box
#
# Set the minimum y value to -1.
#
clip: y_min_infinite OFF
clip: box_min 0. -1. 0.
part: modify_end
```

**See Also:**

Associated clip commands
Commands in this Section:

command

command: delay <value>
command: delay_refresh <toggle>
command: part_selection_by <method>

See Also:

User Manual - Section 2.4, Command Files
How To Record and Play Command Files
command: delay

Command:

command: delay <value>

Purpose:

Causes a delay between each command while playing commands from a command file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>value</td>
<td>time in seconds</td>
</tr>
</tbody>
</table>

Notes:

This command is useful for slowing down the playback speed of command files. It is typically used when playing command files for demos.

Example Usage:

```
command delay_refresh OFF
command: delay 2
```

See Also:

Associated command commands
Command:

command: delay_refresh <toggle>

Purpose:

Causes a delay between each command while playing commands from a command file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON updates display after last command</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF updates display after each command</td>
</tr>
</tbody>
</table>

Notes:

If delay refresh is on, the graphics are not redrawn after each command.

Playback of command files can be sped up toggling on delay_refresh at the beginning of the command file and then off towards the end (i.e. just before recording of an animation).

It is advantageous to use this technique for batch animations.

Example Usage:

```
# Save time by not drawing the image after each command
# command: delay_refresh ON
# Other commands to set up the animation
# restore graphics updates
# command: delay_refresh OFF
```

See Also:

Associated command commands
command: part_selection_by

Command:

command: part_selection_by <method>

Purpose:

Determines if command language will record part selections by name or by number as it appears in the part list.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>number record part selections by part list #</td>
</tr>
<tr>
<td></td>
<td></td>
<td>name record part selections by part list name</td>
</tr>
</tbody>
</table>

Notes:

This setting is typically controlled in the Preference dialog. Creating command files that reference names instead of numbers may be more portable if the names used in the data files are relatively generic.

Example Usage:

```
# # Turn visibility of part
# number 2 off
# command: part_selection_by number
part: select_begin
  2
part: select_end
part: modify_begin
part: visible OFF
part: modify_end
command: part_selection_by name
#
# Turn visibility of part named “external flow field”
# off
#
part: select_partname_begin
  "external flow field"
part: select_partname_end
part: modify_begin
part: visible ON
part: modify_end
```

See Also:

Associated command commands
Commands in this Section:

connect

  connect: backend
  connect: connect
  connect: default
  connect: directory <pathname>
  connect: executable <filename>
  connect: login_id <username>
  connect: machine <hostname>
  connect: type <method>

See Also:

  User Manual - Section 6.1, File Menu Functions
  How To Connect Automatically
**connect: backend**

**Command:**

`connect: backend`

**Purpose:**

Indicates that the following `connect:` commands will apply to new server connections.

**Parameters:**

none

**Notes:**

To change the default server connection settings, use the `connect: default` command.

**Example Usage:**

- `connect: backend`
- `connect: machine localhost`
- `connect: executable ensight7.server`
- `connect: directory`
- `connect: type auto`
- `connect: connect`

**See Also:**

Associated `connect` commands
Command:

connect: connect

Purpose:

Cause the client to wait for a connection to the EnSight server.

Parameters:

none

Notes:

The client will try to start the server if an auto connection is specified.

The client will wait and listen for a connection from the server. By default it will listen on TCP port 1106. This port number can be modified with the `-ports #` argument to the client and server.

Example Usage:

connect: backend
connect: machine localhost
connect: executable ensight7.server
connect: directory
connect: type auto
connect: connect

See Also:

Associated connect commands
connect: default

Command:

connect: default

Purpose:

Indicates that the following 'connect:' commands will change the EnSight defaults for future sessions.

Parameters:

none

Notes:

To temporarily change server connection settings, use the 'connect: backend' command.

Example Usage:

connect: default
connect: machine localhost
connect: executable ensight7.server
connect: directory /tmp
connect: type auto

See Also:

Associated connect commands
Command:

connect: directory <pathname>

Purpose:

Specifies the directory shown in the Data Reader dialog.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>pathname</td>
<td>name of the directory</td>
</tr>
</tbody>
</table>

Example Usage:

# Show the /tmp director on 'slim' in the Data Reader dialog
connect: backend
connect: machine slim
connect: executable ensight7.server
connect: directory /tmp
connect: type auto
connect: connect

See Also:

Associated connect commands
**connect: executable filename**

**Command:**

```plaintext
command: executable <filename>
```

**Purpose:**

Specifies the file name of the EnSight server for automatic connections initiated by the client.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the server</td>
</tr>
</tbody>
</table>

**Notes:**

The filename can be a complete path name to the server otherwise the server executable must be found in your default path on the host running the server.

**Example Usage:**

```plaintext
# use server found in /usr/local/bin/
connect: backend
class: machine slim
class: executable /usr/local/bin/ensight7.server
class: directory /tmp
class: type auto
class: connect
```

**See Also:**

Associated connect commands
Command:

```
connect: login_id <username>
```

Purpose:

Specifies a different user name to use on the computer where the server will run.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>username</td>
<td>login name</td>
</tr>
</tbody>
</table>

Notes:

For auto connections the client will try to start the server on a remote computer using the `rsh` command. If a user name is specified, it will be used as part of the rsh command. In lieu of the rsh command, a different command can be used as specified by the `-rsh command` argument to the client.

Example Usage:

```
# log in to host slim as user 'joe'
connect: backend
connect: machine slim
connect: login_id joe
connect: executable ensight7.server
connect: directory
connect: type auto
connect: connect
```

See Also:

Associated `connect` commands
**Command:**

```plaintext
cancel: machine <hostname>
```

**Purpose:**

Specifies the hostname where EnSight server should be run for automatic connections initiated by the client.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>hostname</td>
<td>name of the computer where the server should run</td>
</tr>
</tbody>
</table>

**Notes:**

The name specified must be an Internet accessible hostname or IP address. You must be able to rlogin (or ssh) into this machine.

**Example Usage:**

```plaintext
# use an auto connection to host 'slim'
cancel: backend
cancel: machine slim
cancel: executable ensight7.server
cancel: directory /tmp
cancel: type auto
cancel: connect
```

**See Also:**

Associated `cancel` commands
Command:

```
connect: type <method>
```

Purpose:

Specifies whether the EnSight server should be started by the client or by the user.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>auto</td>
</tr>
<tr>
<td></td>
<td></td>
<td>user starts the server</td>
</tr>
</tbody>
</table>

Example Usage:

```
# use a manual connection
connect: backend
connect: type manual
connect: connect

# use an auto connection
connect: backend
connect: machine slim
connect: executable ensight7.server
connect: directory /tmp
connect: type auto
connect: connect
```

See Also:

Associated `connect` commands
connect: type value
Commands in this Section:
contour

contour: begin
contour: end
contour: component <vector_component>
contour: create
contour: display_offset <offset>
contour: distribution <distribution>
contour: label_decimal_places <num>
contour: label_format <format>
contour: label_rgb <red_val> <grn_val> <blu_val>
contour: label_spacing <distance>
contour: label_visible <toggle>
contour: levels <num_levels>
contour: levels_visible <toggle>
contour: range <min> <max>
contour: select_default
contour: subcontours <num>
contour: sublevels <num>
contour: sublevels_visible <toggle>
contour: sync_to_palette <toggle>
contour: variable <var_name>

See Also:

User Manual - Section 7.2, Contour Create/Update
How To Create Contours
**contour: begin/end**

**Command:**

```plaintext
contour: begin
contour: end
```

**Purpose:**

Delimit the modifications for contour attributes.

**Parameters:**

*none*

**Example Usage:**

```plaintext
part: select_begin
  2
part: select_end
contour: begin
contour: variable temperature
contour: end
contour: create
```

**See Also:**

Associated `contour` commands
Command:

contour: component <vector_component>

Purpose:

If contouring by a vector specifies component or magnitude.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>vector_component</td>
<td>One of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>magnitude</td>
<td>use magnitude</td>
</tr>
</tbody>
</table>

Notes:

If not specified "magnitude" is used.

Example Usage:

```plaintext
# Create contours of the x-component of velocity on part 2
#
part: select_begin
  2
part: select_end
contour: begin
contour: variable velocity
contour: component x
contour: end
contour: create
```

See Also:

Associated contour commands
contour: create

Command:

```
countour: create
```

Purpose:

Create a contour part with the currently defined attributes using the currently selected parts as parent parts.

Parameters:

none

Notes:

The contour part is created using the currently selected parts as the parent part.
The contour part is created using the currently set contour attributes.

Example Usage:

```
part: select_begin
  2
part: select_end
contour: begin
contour: variable temperature
contour: end
contour: create
```

See Also:

Associated contour commands
Command:
contour: display_offset <offset>

Purpose:
Translate the contour geometry in the surface normal direction by <offset> units.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset</td>
<td>number of units in world coordinates to translate the contour information</td>
</tr>
</tbody>
</table>

Notes:
Useful option when displaying contour parts on top of shaded objects in order to lift the contour line objects closer to the user to properly view them.

Works only if the surface normals are consistent.

Positive values are offsets in the surface normal direction while negative values are offsets in the opposite direction.

Example Usage:
```
# Create a contour part of velocity magnitude
# displaying it offset from the surface by .01 in the
# negative surface normal direction
#
part: select_begin
  2
part: select_end
contour: begin
contour: variable velocity
contour: display_offset -.01
contour: end
contour: create
```

See Also:
Associated contour commands
contour: distribution

Command:

```
contour: distribution <distribution>
```

Purpose:

Specifies the minimum and maximum contour levels when contours are not tied to the variable's palette.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>distribution</td>
<td>linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logarithmic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>quadratic</td>
</tr>
</tbody>
</table>

Notes:

Only used when "contour: sync_to_palette OFF"

Example Usage:

```
# Create contours on part 2
part: select_begin
  2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
# Create 8 contours from 0 to 4.5 using a quadratic distribution
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
# Turn on labels spaced every 2 units
# Using a floating point representation with 2 decimal places
contour: label_visible ON
contour: label_spacing 2.0
contour: label_format floating_point
contour: label_decimal_places 2
contour: end
contour: create
```

See Also:

Associated contour commands
Command:

```
contour: label_decimal_places <num>
```

Purpose:
Specify the number of decimal places to use for contour labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>The number of decimal places</td>
</tr>
</tbody>
</table>

Notes:
Used only if labels are visible

Example Usage:

```
# Create contours on part 2
#
part: select_begin
   2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
# create 8 contours from 0 to 4.5 using a quadratic distribution
#
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
#
# turn on labels spaced every 2 units
# using a floating point representation with 2 decimal places
#
contour: levels_visible ON
contour: label_visible ON
contour: label_spacing 2.0
contour: label_format floating_point
contour: label_decimal_places 2
contour: end
contour: create
```

See Also:

Associated contour commands
contour: label_format

Command:

```
contour: label_format <format>
```

Purpose:

Specify the format for contour labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>format</td>
<td>floating_point Use floating point format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exponential Use exponential format</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Create contours on part 2
#
part: select_begin
   2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
#
# create 8 contours from 0 to 4.5 using a quadratic distribution
#
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
#
# turn on labels spaced every 2 units
# using a floating point representation with 2 decimal places
#
contour: levels_visible ON
contour: label_visible ON
contour: label_spacing 2.0
contour: label_format floating_point
contour: label_decimal_places 2
contour: end
contour: create
```

See Also:

Associated `contour` commands
Command:

```
contour: label_rgb <red_val> <grn_val> <blu_val>
```

**Purpose:**
Set the color for contour labels.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue components of color (0 to 1.)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Example Usage:**

```
# Modify an existing contour part to have red labels
#
part: select_begin
3
part: select_end
part: modify_begin
contour: label_visible ON
contour: label_rgb 1. 0. 0.
part: modify_end
```

**See Also:**

Associated `contour` commands
contour: label_spacing

Command:

    contour: label_spacing <distance>

Purpose:

Control the spacing of contour labels

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>distance</td>
<td>distance between labels</td>
</tr>
</tbody>
</table>

Notes:

The labels will be spaced approximately the value specified.

Example Usage:

    # Modify an existing contour part to have
    # labels .5 units apart
    #
    part: select_begin
    3
    part: select_end
    part: modify_begin
    contour: label_visible ON
    contour: label_spacing .5
    part: modify_end

See Also:

Associated contour commands
Command:

contour: label_visible <toggle>

Purpose:

Turn labels on or off for contour parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to show labels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to show no labels</td>
</tr>
</tbody>
</table>

Notes:

The contour labels are shown as integer values indicating the contour level which corresponds to the color palette level.

Level 1 is the lowest level for the color palette.

Subcontours are not labeled.

Example Usage:

```plaintext
# Modify an existing contour part to show labels
#
part: select_begin
3
part: select_end
part: modify_begin
contour: label_visible ON
part: modify_end
```

See Also:

Associated contour commands
Contour: Levels

Command:

\texttt{contour: levels <num\_levels>}

Purpose:

Specifies how many contour levels are created between the min and max values.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_levels</td>
<td>The number of contour levels to create</td>
</tr>
</tbody>
</table>

Notes:

Only used when "contour: sync\_to\_palette OFF"

Example Usage:

```plaintext
# Create contours on part 2
# part: select\_begin
  2
part: select\_end
contour: begin
contour: variable temperature
contour: sync\_to\_palette OFF
# # create 8 contours from 0 to 4.5 using a quadratic distribution
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
# # turn on labels spaced every 2 units
# using a floating point representation with 2 decimal places
# contour: label\_visible ON
contour: label\_spacing 2.0
contour: label\_format floating point
contour: label\_decimal\_places 2
contour: end
contour: create
```

See Also:

Associated \textit{contour} commands
Command:

contour: levels_visible <toggle>

Purpose:

Specifies the visibility of the contour levels created between the min and max values.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON if the contour levels are visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF if the contour levels are not visible</td>
</tr>
</tbody>
</table>

Notes:

Only used when "contour: sync_to_palette OFF"

Example Usage:

```plaintext
# Create contours on part 2
part: select_begin
  2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
# create 8 contours from 0 to 4.5 using a quadratic distribution
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
# turn on labels spaced every 2 units
# using a floating point representation with 2 decimal places
contour: levels_visible ON
contour: label_visible ON
contour: label_spacing 2.0
contour: label_format floating_point
contour: label_decimal_places 2
contour: end
contour: create
```

See Also:

Associated contour commands
contour: range

Command:

```
contour: range <min> <max>
```

Purpose:

Specifies the minimum and maximum contour levels when contours are not tied to the variable’s palette.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min</td>
<td>The minimum contour value</td>
</tr>
<tr>
<td></td>
<td>max</td>
<td>The maximum contour value</td>
</tr>
</tbody>
</table>

Notes:

Only used when “contour: sync_to_palette OFF”

Example Usage:

```plaintext
# Create contours on part 2
# part: select_begin
  2
  part: select_end
  contour: begin
  contour: variable temperature
  contour: sync_to_palette OFF
  # create 8 contours from 0 to 4.5 using a quadratic distribution
  # contour: distribution quadratic
  contour: range 0. 4.5
  contour: levels 8
  # turn on labels spaced every 2 units
  # using a floating point representation with 2 decimal places
  contour: label_visible ON
  contour: label_spacing 2.0
  contour: label_format floating_point
  contour: label_decimal_places 2
  contour: end
  contour: create
```

See Also:

Associated contour commands
Command:

contour: select_default

Purpose:

Sets the target to the default settings for subsequent attribute modifications.

Parameters:

none

Example Usage

```
# Set the default so two sub-contours will be generated
#
contour: select_default
part: modify_begin
contour: subcontours 2
part: modify_end
```

See Also:

Associated contour commands
contour: subcontours

Command:

```
contour: subcontours <num>
```

Purpose:

Add a specified number of contour loops linearly distributed between the variable palette levels.

(Note, this command is no longer in use as of EnSight 7.6)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of contour values to create between variable palette levels</td>
</tr>
</tbody>
</table>

Notes:

Contours are generated using the color palette for the variable as the contour values. By adding subcontours additional contour levels are generated between the defined levels.

Example Usage:

```
# Create contours on part 2 using 5 sub-contours
#
part: select_begin
2
part: select_end
contour: begin
contour: variable temperature
contour: subcontours 5
contour: end
contour: create
```

See Also:

Associated contour commands
Command:

```
contour: sublevels <num>
```

Purpose:

Add a specified number of contours distributed between the main contour levels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>Number of contours to create between the main contour levels.</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Create contours on part 2
part: select_begin
  2
part: select_end
contour: begin
contour: variable_temperature
contour: sync_to_palette OFF
#
# create 8 contours from 0 to 4.5 using a quadratic distribution
#
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
#
# turn off the visibility of the main contours and turn
# subcontours on - make 2 subcontours between each of the 8 levels.
#
contour: levels_visible OFF
contour: sublevels_visible ON
contour: sublevels 2
contour: end
contour: create
```

See Also:

Associated `contour` commands
**contour: sublevels_visible**

**Command:**

```
contour: sublevels_visible <toggle>
```

**Purpose:**

Specifies the visibility of the contour sub-levels created between the min and max values.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
</table>
| constant | toggle    | ON:
|          |           | if the contour sub-levels are visible            |
|          |           | OFF:
|          |           | if the contour sub-levels are not visible        |

**Notes:**

Only used when "contour: sync_to_palette OFF"

**Example Usage:**

```
# Create contours on part 2
part: select_begin
   2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
#
# create 8 contours from 0 to 4.5 using a quadratic distribution
#
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
#
# turn off the visibility of the main contours and turn subcontours on
#
contour: levels_visible OFF
contour: sublevels_visible ON
contour: sublevels 2
contour: end
contour: create
```

**See Also:**

Associated **contour** commands
contour: sync_to_palette

Command:

contour: sync_to_palette <toggle>

Purpose:

Specifies contour part creation to be tied to the variable palette or by user input.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> if the contour part is created using the variable’s palette</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> if the contour part is created using the defined min/max information</td>
</tr>
</tbody>
</table>

Notes:

Example Usage:

```
# Create contours on part 2
#
part: select_begin
  2
part: select_end
contour: begin
contour: variable temperature
contour: sync_to_palette OFF
#
# create 8 contours from 0 to 4.5 using a quadratic distribution
#
contour: distribution quadratic
contour: range 0. 4.5
contour: levels 8
#
# turn on labels spaced every 2 units
# using a floating point representation with 2 decimal places
#
contour: label_visible ON
contour: label_spacing 2.0
contour: label_format floating_point
contour: label_decimal_places 2
contour: end
contour: create
```

See Also:

Associated contour commands
Command:

```plaintext
contour: variable <var_name>
```

Purpose:

Use this variable for creating a contour part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var_name</td>
<td>create contours from this variable</td>
</tr>
</tbody>
</table>

Notes:

The variable must be active before the contour part can be created.

Example Usage:

```plaintext
# Create contours of velocity magnitude of part 2
part: select_begin
  2
part: select_end
contour: begin
contour: variable velocity
contour: end
contour: create
```

See Also:

Associated contour commands
Commands in this Section:

curve

curve: assign <option> <description>
curve: delete
curve: desc <description>
curve: line_style <option>
curve: line_type <option>
curve: line_width <width>
curve: load <filename>
curve: marker <option>
curve: marker_scale <size>
curve: normalize_x <toggle>
curve: normalize_y <toggle>
curve: rgb <red_val> <grn_val> <blu_val>
curve: save <type> <filename>
curve: scale <x_scale> <y_scale>
curve: select_all
curve: select_begin
curve: select_end
curve: select_default
curve: smooth_subpoints <num>
curve: visible <toggle>

See Also:

User Manual - Section 8.3, Plot Mode
How To Change Plot Attributes
**curve: assign**

**Command:**

```
curve: assign <option> <description>
```

**Purpose:**

Assign a selected curve to the selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>rescale the plot according to the value extents of the curve(s) (default).</td>
</tr>
<tr>
<td></td>
<td>no_rescale</td>
<td>do not rescale the plot according to the values of the curve(s).</td>
</tr>
<tr>
<td>string</td>
<td>description</td>
<td>description of the plotter</td>
</tr>
</tbody>
</table>

**Notes:**

String description not needed if assigning a new curve to an existing plot.

**Example Usage:**

```
curve: select_begin
    0
curve: select_end
curve: assign rescale Velocity vs. Distance for part 2
plot: select_begin
    0
plot: select_end
```

**See Also:**

Associated curve commands
Command:

    curve: delete

Purpose:

    Delete the selected curve(s).

Parameters:

    none.

Example Usage:

    curve: select_begin
    0
    curve: select_end
    curve: delete

See Also:

    Associated curve commands
curve: desc

Command:

    curve: desc <description>

Purpose:

Specify curve description.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>description</td>
<td>description of the selected curve</td>
</tr>
</tbody>
</table>

Example Usage:

    curve: select_begin
    0
    curve: select_end
    curve: desc Velocity vs. Distance for part 2

See Also:

Associated curve commands
Command:

`curve: line_style <option>`

Purpose:

Specifies the line style to use for the selected curves.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dash</td>
</tr>
</tbody>
</table>

Notes:

Only works when `line_type` is `connect_dots`.

Example Usage:

```plaintext
curve: select_begin
1
curve: select_end
curve: line_type connect_dots
curve: line_style dotted
```

See Also:

Associated `curve` commands
**curve: line_type**

**Command:**
```
curve: line_type <option>
```

**Purpose:**
Specifies the line type to use for the selected curves.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>none, curve points not connected, represented by marker type selection</td>
</tr>
<tr>
<td></td>
<td></td>
<td>connect_dots, curve points connected with linear line segments (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>smooth, curve points connected with smoothed line segments</td>
</tr>
</tbody>
</table>

**Example Usage:**
```
curve: select_begin
1
curve: select_end
curve: line_type none
```

**See Also:**
Associated curve commands
Command:

```
curve: line_width <width>
```

Purpose:

Specify the (pixel) line width of the selected curve(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>pixel line width of 1, 2 (default), 3, or 4.</td>
</tr>
</tbody>
</table>

Example Usage:

```
curve: select_begin
1
curve: select_end
curve: line_width 3
```

See Also:

Associated `curve` commands
curve: load

Command:

```
curve: load <filename>
```

Purpose:

Load the specified (saved) curve file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>file (path and) name of the saved curve file</td>
</tr>
</tbody>
</table>

Notes:

See the curve file formats under "curve: save".

Example Usage:

```
curve: select_begin
2
curve: select_end
curve: load Curve0
```

See Also:

Associated `curve` commands
Command:

```
curve: marker <option>
```

Purpose:

Specify the type of marker in which to represent the points of the selected curve(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>none curve points represented by no symbol</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dot     curve points represented as dots</td>
</tr>
<tr>
<td></td>
<td></td>
<td>circle  curve points represented as circles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>triangle curve points represented as triangles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>square   curve points represented as squares</td>
</tr>
</tbody>
</table>

Example Usage:

```
curve: select_begin
  0 1
curve: select_end
curve: marker_type circle
```

See Also:

Associated `curve` commands
curve: marker_scale

Command:

\texttt{curve: marker\_scale \textless\textgreater size}\n
Purpose:

Specify the size of the marker type which represents the points of the selected curve(s).

Parameters:

\begin{tabular}{|c|c|p{10cm}|}
\hline
Type & Parameter & Description \\
\hline
float & size & size of the curve point markers (default = 1.) \\
\hline
\end{tabular}

Example Usage:

\begin{verbatim}
curve: select\_begin
  0 1
curve: select\_end
curve: marker\_scale 2.0000e+00
\end{verbatim}

See Also:

Associated \texttt{curve} commands
Command:

```
curve: normalize_x <toggle>
curve: normalize_y <toggle>
```

Purpose:

Specify whether to normalize the abscissa range of the selected curve(s) to the interval $[0.,1.]$.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON represent the curve abscissa coordinate values in the normalized range $[0.,1.]$</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF represent the curve abscissa coordinate values in the actual range of values (default)</td>
</tr>
</tbody>
</table>

Notes:

This means to divide all abscissa coordinates of the curve by the maximum abscissa coordinate value.

Example Usage:

```
curve: select_begin
  0 1
curve: select_end
curve: normalize_x ON
curve: normalize_y OFF
```

See Also:

Associated `curve` commands
Command:

\texttt{curve: rgb <red_val> <grn_val> <blu_val>}

Purpose:

Specify the color of the selected curve(s) via red, green, and blue component values.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue component of color (0 to 1.)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
# Set the curve color to cyan
#
curve: select_begin
1
curve: select_end
curve: rgb 0.0000e+00 1.0000e+00 1.0000e+00
```

See Also:

Associated curve commands
**Command:**

`curve: save <type> <filename>`

**Purpose:**

Specify how to save the selected curve(s) data to a file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>formatted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>xy_data</td>
</tr>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the file in which to save the curve points</td>
</tr>
</tbody>
</table>

**Notes:**

formatted - curve data saved in the following format:

**velocity vs. Distance for line tool**

<table>
<thead>
<tr>
<th>Distance</th>
<th>Value</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00000e+00</td>
<td>5.56944e-01</td>
<td>-1.84272e+00</td>
<td>5.00623e-01</td>
<td>1.02349e+00</td>
</tr>
<tr>
<td>1.16535e+00</td>
<td>5.06148e-01</td>
<td>-6.77367e-01</td>
<td>5.00623e-01</td>
<td>1.02349e+00</td>
</tr>
<tr>
<td>2.33070e+00</td>
<td>4.33805e-02</td>
<td>4.87984e-01</td>
<td>5.00623e-01</td>
<td>1.02349e+00</td>
</tr>
<tr>
<td>3.49605e+00</td>
<td>3.41879e-01</td>
<td>1.65334e+00</td>
<td>5.00623e-01</td>
<td>1.02349e+00</td>
</tr>
<tr>
<td>4.66140e+00</td>
<td>5.29504e-01</td>
<td>2.81869e+00</td>
<td>5.00623e-01</td>
<td>1.02349e+00</td>
</tr>
</tbody>
</table>

Minimum value overall
At Point = 4.87984e-01 5.00623e-01 1.02349e+00,
Dist. = 2.33070e+00, Value = 4.33805e-02

Maximum value overall
At Point = -1.84272e+00 5.00623e-01 1.02349e+00,
Dist. = 0.00000e+00, Value = 5.56944e-01

xy_data - curve data saved in the following (x,y) format for importing into a spreadsheets:

**velocity vs. Distance for line tool**

Distance

```
1
5
0 0.556944
1.16535 0.506148
2.3307 0.0433805
3.49605 0.341879
4.6614 0.529504
```

**Example Usage:**

```
curve: select_begin
0
curve: select_end
curve: save xy_data Curve0
```

**See Also:**

Associated curve commands
curve: scale

Command:

```
curve: scale <x_scale> <y_scale>
```

Purpose:

Scales the x and y query by the values given.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scale</td>
<td>query x scale factor</td>
</tr>
<tr>
<td></td>
<td>y_scale</td>
<td>query y scale factor</td>
</tr>
</tbody>
</table>

Notes:

Only scales the curve visually, does not modify the query information.

Example Usage:

```
curve: select_begin
1
curve: select_end
curve: scale 60.0 1.
```

See Also:

Associated curve commands
Command:

curve: select_all

Purpose:

Select all curves for subsequent operations.

Parameters:

none.

Example Usage:

curve: select_all

See Also:

Associated curve commands
**Command:**

```plaintext
curve: select_begin
curve: select_end
```

**Purpose:**

Curve(s) selection construct for subsequent curve operation.

**Parameters**

none

**Notes:**

Curve id’s to be selected must be specified between `curve: select_begin` and `curve: select_end`.

**Example Usage:**

```plaintext
curve: select_begin
  0
curve: select_end
curve: assign rescale Velocity vs. Distance for part 2
plot: select_begin
  0
plot: select_end
```

**See Also:**

Associated `curve` commands
Command:

```
curve: select_default
```

**Purpose:**

Specify the default curve to be selected - or unselect all curves.

**Parameters:**

none.

**Notes:**

This is used to set the default (unselected) curve attributes.

**Example Usage:**

```
curve: select_default
```

**See Also:**

Associated curve commands
curve: smooth_subpoints

Command:

curve: smooth_subpoints <num>

Purpose:

Specify the number of smooth subpoints to use between curve points of the selected curve.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>number of subpoints in which to display the smoothed line type between curve points (default is 3)</td>
</tr>
</tbody>
</table>

Notes:

The curve line type must be smooth.

Example Usage:

curve: select_begin
1
curve: select_end
curve: line_type smooth
curve: smooth_subpoints 4.0000e+00

See Also:

Associated curve commands
Command:

```
curve: visible <toggle>
```

Purpose:

Toggle the selected curve(s) visibility.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON  curve visible (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF  curve invisible</td>
</tr>
</tbody>
</table>

Example Usage:

```
curve: select_begin
1
curve: select_end
curve: visible OFF
```

See Also:

Associated `curve` commands
Commands in this Section:

data

- data: binary_files_are <endian_order>
- data: boundary <filename>
- data: format <format_type>
- data: geometry <filename>
- data: measured <filename>
- data: new_static_done <num>
- data: new_static_ready
- data: new_time <time>
- data: new_transient_time <time>
- data: path <data_path>
- data: plot3ddimension <dimension>
- data: plot3dblank <toggle>
- data: plot3dmulti_zone <toggle>
- data: plot3dread_as <binary_flag>
- data: read
- data: result <filename>
- data: start_time <step_number>

See Also:

- User Manual - Section 2.1, Internal Readers
- How To Read Data
- How To Display Discrete or Experimental Data
data: binary_files_are

Command:

```
data: binary_files_are <endian_order>
```

Purpose:

Sets the byte (endian) order for binary geometry, result, and measured data files.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>endian_order</td>
<td>The endian order for the binary files and must be one of:</td>
</tr>
<tr>
<td></td>
<td>little_endian</td>
<td>byte order of Intel and Alpha CPU's</td>
</tr>
<tr>
<td></td>
<td>big_endian</td>
<td>byte order of SGI, SUN, HP, IBM</td>
</tr>
<tr>
<td></td>
<td>native</td>
<td>byte order of machine running the EnSight server</td>
</tr>
</tbody>
</table>

Notes:

EnSight assumes that the geometry, result, and measured data files are of the same byte order.

Must be specified before a "data: read" command.

Example Usage:

```
VERSION 7.40
data: binary_files_are big_endian
data: format ensight
data: path /usr/tmp
data: geometry ski_c.geo
data: result ski_c.res
data: read
```

See Also:

Associated data commands
Command:

```
data: boundary <filename>
```

Purpose:

Specify the name for the boundary file. Boundary files provide a way to externally specify the ijk extents of bounding surfaces, etc. for structured data. The resultant is an unstructured part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>boundary file name</td>
</tr>
</tbody>
</table>

Notes:

The filename is concatenated with the path defined via the "data: path" command.

Since the boundary file depends on the structured block/zone definitions in the geometry file, the use of a boundary file requires the specification of a geometry file with structured data as well. For EnSight case format, the boundary file is contained within the casefile and this command is not needed. It must be used for other structured data formats - such as PLOT3D.

When specified, unstructured parts can be created according to the boundary file definitions in the unstructured portion of the Data Part Loader dialog.

Example Usage:

Read a structured geometry file and a boundary file.

```
VERSION 7.40
data: binary_files_are_big_endian
data: format plot3d
data: plot3dblank OFF
data: plot3dmulti_zone ON
data: plot3dread_as ascii
data: plot3ddimension 3d
data: path /usr/tmp
data: geometry single.grid
data: boundary single.bnd
data: result single.q
data: read
```

See Also:

Associated data commands
Command:

```
data: format <format_type>
```

Purpose:

Set the format type for the geometry and result files.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>format_type</td>
<td>The format type which must be one of the following (or the name of a user defined reader):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ensight</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plot3d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fidap</td>
</tr>
<tr>
<td></td>
<td></td>
<td>n3s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>estet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mpgs4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>movie</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fluent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ansys</td>
</tr>
<tr>
<td></td>
<td></td>
<td>abaqus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>case</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fast-unstructured</td>
</tr>
</tbody>
</table>

Example Usage:

```
# # Read a datafile in case format and load a part from it.
#
VERSION 7.40
data: binary_files_are big_endian
data: format case
data: path /usr/tmp
data: geometry cube.case
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
```

See Also:

Associated data commands
Command:

```data: geometry <filename>```

Purpose:

Set the name for the file containing geometric information.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>geometry file name</td>
</tr>
</tbody>
</table>

Notes:

The filename is concatenated with the path defined via the "data: path" command.

The meaning of "geometry" is different depending on the data format. For example, if the format is `CASE`, the "geometry" file is the case file, while if the format is `ANSYS`, the file refers to the ANSYS result file.

Example Usage:

```
VERSION 7.40
data: binary_files_are big_endian
data: format case
data: geometry cube.case
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin 1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
```

See Also:

Associated data commands
data: measured

Command:

\texttt{data: measured \textless \textit{filename}\textgreater}

Purpose:

Specify the name for the measured particle file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>measured file name</td>
</tr>
</tbody>
</table>

Notes:

The filename is concatenated with the path defined via the \texttt{data: path} command.

It is not possible to read a measured file without also specifying a geometry file, or having specified a geometry file previously.

When specified, the part containing the measured particle data will be generated upon a \texttt{data: read} command, i.e., this part type will not be shown in the various part loaders.

Example Usage:

Read a geometry file and a measured particle file and create a part.

\begin{verbatim}
VERSION 7.40
data: format ensight
data: path /usr/tmp
data: geometry cube.geom
data: measured cube.mres
data: start_time 1
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
\end{verbatim}

See Also:

Associated \texttt{data} commands
Command:

```
data: new_static_done <num>
```

**Purpose:**

Informs the client that the static data files have been modified.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>num</td>
<td>0: geometry is not changing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1: geometry is changing</td>
</tr>
</tbody>
</table>

**Example Usage:**

*Internal command used only by the dynamic data interface.*

**See Also:**

Associated data commands
**data: new_static_ready**

**Command:**

```
data: new_static_ready
```

**Purpose:**

Informs the client that the static data files are about to be modified.

**Parameters:**

```
none
```

**Example Usage:**

*Internal command used only by the dynamic data interface.*

**See Also:**

Associated data commands
Command:

\texttt{data: new\_time <time>}

Purpose:

Informs client that a new transient time step is available

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time</td>
<td>simulation time</td>
</tr>
</tbody>
</table>

Notes:

Each time the command is called, its value must be increasing.

Example Usage:

\textit{Internal command used only by the dynamic data interface.}

See Also:

Associated \texttt{data} commands
data: new_transient_time

Command:

    data: new_transient_time <time>

Purpose:

    Informs client of last transient time step available

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time</td>
<td>simulation time</td>
</tr>
</tbody>
</table>

Notes:

    Each time the command is called, its value must be increasing.

Example Usage:

    Internal command used only by the dynamic data interface.

See Also:

    Associated data commands
**Command:**

```
data: path <data_path>
```

**Purpose:**

Specify the directory under which the data files are located.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>data_path</td>
<td>path to the data files</td>
</tr>
</tbody>
</table>

**Notes:**

The path can be fully or partially qualified. All (geometry, result, and measured) file names are post concatenated with the path given to arrive at the full file name.

**Example Usage:**

Read a data file located in `/usr/tmp` and load a part from it.

```
VERSION 7.40
data: binary_files_are big_endian
data: format case
data: path `/usr/tmp`
data: geometry cube.case
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin
1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
```

**See Also:**

Associated data commands
**data: plot3ddimension**

**Command:**

```
data: plot3ddimension <dimension>
```

**Purpose:**

When the format is plot3d, specifies the dimensionality of the data.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>dimension</td>
<td>The dimensionality of the data and must be one of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2d</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3d</td>
</tr>
</tbody>
</table>

**Notes:**

EnSight attempts to determine the dimensionality of plot3d data, if this command is not given.

It must be specified before a "data: read" command is given.

**Example Usage:**

```
# Read a 3D plot3d file and extract a part.
# VERSION 7.40
data: format plot3d
data: plot3diblank OFF
data: plot3dmulti_zone OFF
data: plot3dread_as c_binary
data: plot3ddimension 3d
data: path /usr/tmp
data: geometry shuttle.xyz
data: result shuttle.q
data: read
data_partbuild: begin
data_partbuild: data_type structured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 52
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 1
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: create
```

**See Also:**

Associated *data* commands
Command:

```command
data: plot3diblank <toggle>
```

Purpose:

When the format is plot3d, specifies the iblanking value for the geometry file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON for iblanking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for no iblanking</td>
</tr>
</tbody>
</table>

Notes:

Must be specified before a "data: read" command is given.

Example Usage:

```bash
# Read a plot3d file with no iblanking and extract a part.
#
VERSION 7.40
data: format plot3d
data: plot3diblank OFF
data: plot3dmulti_zone OFF
data: plot3dread_as c_binary
data: plot3ddimension 3d
data: path /usr/tmp
data: geometry shuttle.xyz
data: result shuttle.q
data: read
data_partbuild: begin
data_partbuild: data_type structured
data_partbuild: select_begin
 1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 52
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 1
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: create
```

See Also:

Associated data commands
data: plot3dmulti_zone

Command:

data: plot3dmulti_zone <toggle>

Purpose:

When the format is plot3d, specifies that the file is single or multi zone.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

EnSight will attempt to determine if the file is single or multi-zone if this command is not specified.

Must be specified before a "data: read" command is given.

Example Usage:

```bash
# Read a single zone plot3d file and extract a part.
#
VERSION 7.40
data: format plot3d
data: plot3dblank OFF
data: plot3dmulti_zone OFF
data: plot3dread_as c_binary
data: plot3ddimension 3d
data: path /usr/tmp
data: geometry shuttle.xyz
data: result shuttle.q
data: read
data_partbuild: begin
data_partbuild: data_type structured
data_partbuild: select_begin
1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 52
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 1
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: create
```

See Also:

Associated data commands
Command:

```
data: plot3dread_as <binary_flag>
```

Purpose:

When the format is plot3d, specifies how the file is formatted.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>binary_flag</td>
<td>The format flag which must be one of:</td>
</tr>
<tr>
<td></td>
<td>ascii</td>
<td>the file is ASCII</td>
</tr>
<tr>
<td></td>
<td>c_binary</td>
<td>the file was written in C binary</td>
</tr>
<tr>
<td></td>
<td>fortran_binary</td>
<td>the file was written in Fortran binary</td>
</tr>
</tbody>
</table>

Notes:

If the user does not specify, EnSight will attempt to determine the binary nature of the data files.

It must be specified before a "data: read" command is given.

All files (geometry, result, and measured) must be of the same binary nature.

Example Usage:

```
# Read a c binary plot3d file and extract a part.
# VERSION 7.40
data: format plot3d
data: plot3dblank OFF
data: plot3dmulti_zone OFF
data: plot3dread_as c_binary
data: plot3ddimension 3d
data: path /usr/tmp
data: geometry shuttle.xyz
data: result shuttle.q
data: read
data_partbuild: begin
data_partbuild: data_type structured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 52
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 1
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: create
```

See Also:

Associated data commands
Command:

    data: read

Purpose:

    Read the geometry, result, and/or measured data files.

Parameters:

    none

Notes:

    The geometry and/or result and/or measured data file names must be set before making this call.

Example Usage:

    # Read a geometry and associated result file and create a part.
    #
    VERSION 7.40
    data: format ensight
    data: path /usr/tmp
    data: geometry cube.geom
    data: result cube.res
    data: read
    data_partbuild: begin
    data_partbuild: data_type unstructured
    data_partbuild: select_begin
        1
    data_partbuild: select_end
    data_partbuild: create
    data_partbuild: end

See Also:

    Associated data commands
Command:

data: result <filename>

Purpose:

Set the name for the file containing result information.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>result file name</td>
</tr>
</tbody>
</table>

Notes:

The usage of a result file depends on the data format. For some formats the result file is not necessary, while for others the result file either directly contains result information or may be another file containing information pointing to the various files that may exist.

The filename is concatenated with the path defined via the "data: path" command.

It is not possible to read a result file without also specifying a geometry file, or having specified a geometry file previously.

Example Usage:

```plaintext
# Read a geometry and result file,
# create a part,
# rotate the scene,
# and color the part by a variable
#
VERSION 7.40
data: format ensight
data: path /usr/tmp
data: geometry cube.geom
data: result cube.res
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
view_transf: rotate -91.339279 2.611849 0.000000
view_transf: rotate 18.749998 42.660221 0.000000
variables: activate temperature
part: select_all
part: modify_begin
part: colorby_palette temperature
part: modify_end
```

See Also:

Associated data commands
data: start_time

Command:

```plaintext
data: start_time <step_number>
```

Purpose:

When reading transient data load the timestep indicated as the initial time step.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_number</td>
<td>timestep to use for the initial data load. Values range from 1 (the first timestep) to N where N is the total number of timesteps supplied.</td>
</tr>
</tbody>
</table>

Notes:

It is not possible to specify a fractional timestep.

The value specified is a step number, not a time value.

Example Usage:

```plaintext
# Read a geometry file and a measured particle file
# at the first timestep, then create a part.
# VERSION 7.40
data: format ensight
data: path /usr/tmp
data: geometry cube.geom
data: measured cube.mres
data: start_time 1
data: read
data_partbuild: begin
data_partbuild: data_type unstructured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: create
data_partbuild: end
```

See Also:

Associated **data** commands
Commands in this Section:

**data_partbuild**

```plaintext
data_partbuild: begin
  data_partbuild: end
  data_partbuild: create
  data_partbuild: create_iblank
  data_partbuild: data_type <type>
  data_partbuild: description <desc>
  data_partbuild: domain <option>
  data_partbuild: estet_domain <option>
  data_partbuild: estetbuildvector
  data_partbuild: estetdelta <i_del> <j_del> <k_del>
  data_partbuild: estetnoderange_i <beg> <end>
  data_partbuild: estetnoderange_j <beg> <end>
  data_partbuild: estetnoderange_k <beg> <end>
  data_partbuild: estetstep <i_step> <j_step> <k_step>
  data_partbuild: estetvector_x <scalar_name>
  data_partbuild: estetvector_y <scalar_name>
  data_partbuild: estetvector_z <scalar_name>
  data_partbuild: estetvectordesc <desc>
  data_partbuild: iblank_type <desc>
  data_partbuild: mpgsload <option>
  data_partbuild: n3sall_elements
  data_partbuild: n3sboundary
  data_partbuild: n3scode <desc>
  data_partbuild: n3scolor_number <num>
  data_partbuild: n3scondition <desc>
  data_partbuild: nodedelta <i_del> <j_del> <k_del>
  data_partbuild: noderange_i <beg> <end>
  data_partbuild: noderange_j <beg> <end>
  data_partbuild: noderange_k <beg> <end>
  data_partbuild: nodestep <i_step> <j_step> <k_step>
  data_partbuild: select_begin
  data_partbuild: select_end
```

See Also:

- User Manual - Section 2.1, Internal Readers
- How To Read EnSight Gold Data
- How To Read EnSight 5 Data
- How To Read EnSight 6 Data
- How To Read ABAQUS Data
- How To Read ANSYS Data
- How To Read ESTET Data
- How To Read FAST Unstructured Data
- How To Read PLOT3D Data
- How To Read FIDAP NEUTRAL Data
- How To Read Fluent Universal Data
How To Read MOVIE.BYU Data
How To Read MPGS Data
How To Read N3S Data
How To Read User Defined Data
Command:

```
data_partbuild: begin
<commands>
data_partbuild: end
```

Purpose:

Delineates commands issued while using the Data Part Builder dialogs.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>commands</td>
<td>valid command language for part building (can be one or many)</td>
</tr>
</tbody>
</table>

Notes:

These commands exist for memory management reasons. While doing part building it is often necessary to have information in memory that will only be used during the part building process. Thus, the begin indicates the need for this memory, and the end indicates that such memory could be freed for other purposes. All data formats that use the Data Part Builder method use this command (n3s, estet, mpgs4, plot3d, userd, ensight formats, etc).

Example Usage:

```
#
# Starting part building for N3S parts
#
data_partbuild: begin
#
# Building a part entitled "part_all"
#
data_partbuild: description part_all
data_partbuild: n3sall_elements
data_partbuild: create
#
# Building a part entitled "part_color"
#
data_partbuild: description part_color
data_partbuild: n3scolor_number 7
data_partbuild: create
#
# Building a part entitled "part_color"
#
data_partbuild: description part_bc
data_partbuild: n3sboundary
data_partbuild: n3scondition VITESSE_UX
data_partbuild: n3scode Free Node
data_partbuild: create
#
# Stopping part building for N3S parts
#
data_partbuild: end
```

See Also:

Associated `data_partbuild` commands
data_partbuild: create

Command:

```
data_partbuild: create
```

Purpose:

Causes the part to be built according to previously defined attributes or defaults.

Parameters:

none

Notes:

All data formats that use the Data Part Builder method use this command (n3s, estet, mpgs4, plot3d, userd, ensight formats, etc).

Example Usage:

```
# # Starting part building for N3S parts
# data_partbuild: begin
# # Building a part entitled "part_all"
# data_partbuild: description part_all
data_partbuild: n3sall_elements
data_partbuild: create
# # Building a part entitled "part_color"
# data_partbuild: description part_color
data_partbuild: n3scolor_number 7
data_partbuild: create
# # Building a part entitled "part_color"
# data_partbuild: description part_bc
data_partbuild: n3sboundary
data_partbuild: n3scondition VITESSE_UX
data_partbuild: n3scode Free Node
data_partbuild: create
# # Stopping part building for N3S parts
# data_partbuild: end
```

See Also:

Associated `data_partbuild` commands
**data_partbuild: create_iblank**

**Command:**

```
data_partbuild: create_iblank
```

**Purpose:**

Causes unstructured part(s) to be built from structured part(s) according to iblanking values available.

**Parameters:**

none

**Notes:**

All data formats that have structured iblanking use this command (estet, plot3d, EnSight6, EnSight Gold, some userd formats, etc). It is required that a structured part be selected as parent before this command.

**Example Usage:**

```
# First we create a structured estet part entitled "field"
#
data_partbuild: begin
data_partbuild: estetdomain inside
data_partbuild: description field
data_partbuild: estetnoderange_i 1 39
data_partbuild: estetnoderange_j 1 15
data_partbuild: estetnoderange_k 1 28
data_partbuild: estetstep 1 1 1
ndata_partbuild: estetdelta 0 0 0
ndata_partbuild: create
#
# Then we select this as the parent for our ibanked part
#
data_partbuild: select_begin
  1
ndata_partbuild: select_end
#
# Here we set the description desired and the ibanking type
#
data_partbuild: description symm
ndata_partbuild: iblank_type Symmetry (4)
#
# And create it
#
data_partbuild: create_iblank
data_partbuild: end
```

**See Also:**

Associated data_partbuild commands
data_partbuild: data_type

Command:

```
data_partbuild: data_type <type>
```

Purpose:

For those formats that contain both structured and unstructured data (EnSight6, EnSight Gold, and some user defined formats), this command indicates which type to create.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>unstructured to create unstructured parts</td>
</tr>
<tr>
<td></td>
<td></td>
<td>structured to create structured parts</td>
</tr>
</tbody>
</table>

Example Usage:

```
data_partbuild: begin
  #
  # Doing an unstructured ensight part
  #
data_partbuild: data_type unstructured
  #
  # Selecting the first part in the
  # unstructured part building list
  #
data_partbuild: select_begin
  1
  data_partbuild: select_end
  #
  # Naming it "my_unstructured_part"
  # and creating it
  #
data_partbuild: description my_unstructured_part
  data_partbuild: create
  #
  # Now doing a structured ensight part
  #
data_partbuild: data_type structured
  #
  # Selecting the first part in the
  # structured part building list
  # (Note this is not the same part as the
  # unstructured one selected above)
  #
data_partbuild: select_begin
  1
  data_partbuild: select_end
  #
  # Setting ijk ranges, step_by, delta values, etc.
  # and creating it.
  #
data_partbuild: domain all
  data_partbuild: noderange_i 1 3
  data_partbuild: noderange_j 1 3
  data_partbuild: noderange_k 1 3
  data_partbuild: nodestep 1 1
  data_partbuild: nodedelta 0 0 0
  data_partbuild: description my_structured_part
  data_partbuild: create
```
data_partbuild: end

See Also:

Associated data_partbuild commands
data_partbuild: description

Command:

    data_partbuild: description <desc>

Purpose:

Specifies the textual description for a part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>description for the part (it is what is displayed in the user interface)</td>
</tr>
</tbody>
</table>

Example Usage:

```enSight
data_partbuild: begin
#
# Doing an unstructured ensight part
#
data_partbuild: data_type unstructured
#
# Selecting the first part in the
# unstructured part building list
#
data_partbuild: select_begin
1
data_partbuild: select_end
#
# Naming it "my_unstructured_part"
# and creating it
#
data_partbuild: description my_unstructured_part
data_partbuild: create
#
# Now doing a structured ensight part
#
data_partbuild: data_type structured
#
# Selecting the first part in the
# structured part building list
# (Note this is not the same part as the
# unstructured one selected above)
#
data_partbuild: select_begin
1
data_partbuild: select_end
#
# Setting ijk ranges, step_by, delta values, etc.
# and creating it.
#
data_partbuild: domain all
data_partbuild: noderange_i 1 3
data_partbuild: noderange_j 1 3
data_partbuild: noderange_k 1 3
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description my_structured_part
data_partbuild: create
data_partbuild: end
```
See Also:

Associated `data_partbuild` commands
**data_partbuild: domain**

**Command:**

```
data_partbuild: domain <option>
```

**Purpose:**

Specify the iblanking domain to use for EnSight6, EnSight Gold and User-defined models that have structured iblanked data.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>inside for domains that have iblank value of 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>outside for domains that have iblank value of 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all for all domains regardless of iblank value. (Basically ignores iblanking)</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
data_partbuild: begin
# Now doing a structured ensight part
# data_partbuild: data_type structured
# Selecting the first part in the
# structured part building list
# data_partbuild: select_begin
1
data_partbuild: select_end
# Setting ijk ranges, step_by, delta values, etc. and creating it. Note the domain used.
# data_partbuild: domain inside
data_partbuild: noderange_i 1 3
data_partbuild: noderange_j 1 3
data_partbuild: noderange_k 1 3
data_partbuild: nodestep1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description my_inside_part
data_partbuild: create
data_partbuild: end
```

**See Also:**

Associated **data_partbuild** commands
data_partbuild: estet_domain

Command:

    data_partbuild: estet_domain <option>

Purpose:

Specify the iblanking domain to use for estet models.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>inside for domains that have iblank value of INSIDE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>outside for domains that have iblank value of OUTSIDE</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all for all domains regardless of iblank value. (Basically ignores iblanking)</td>
</tr>
</tbody>
</table>

Example Usage:

    data_partbuild: begin
    data_partbuild: estetdomain inside
    data_partbuild: description my_inside_part
    data_partbuild: estetnoderange_i 1 39
    data_partbuild: estetnoderange_j 1 15
    data_partbuild: estetnoderange_k 1 28
    data_partbuild: estetstep 1 1 1
    data_partbuild: estetdelta 0 0 0
    data_partbuild: create
    data_partbuild: end

See Also:

Associated data_partbuild commands
**data_partbuild: estetbuildvector**

**Command:**

```
data_partbuild: estetbuildvector
```

**Purpose:**

Combines estet vector components (given as scalars) into a vector variable.

**Parameters:**

none

**Notes:**

Requires the use of "data_partbuild: estetvectordesc" and "data_partbuild: estetvector_x_*" commands before being issued.

**Example Usage:**

```
data_partbuild: estetvectordesc velocity
data_partbuild: estetvector_x VITESSE_U
data_partbuild: estetvector_y VITESSE_V
data_partbuild: estetvector_z VITESSE_W
data_partbuild: estetbuildvector
```

**See Also:**

Associated data_partbuild commands
data_partbuild: estetdelta

Command:

```
data_partbuild: estetdelta <i_del> <j_del> <k_del>
```

Purpose:

Specify ijk delta value to use when creating more than one ijk surface from the same ijk block. Only one of the deltas may be non-zero.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>i_del</td>
<td>I direction delta value</td>
</tr>
<tr>
<td></td>
<td>j_del</td>
<td>J direction delta value</td>
</tr>
<tr>
<td></td>
<td>k_del</td>
<td>K direction delta value</td>
</tr>
</tbody>
</table>

Example Usage:

```
#  # This will create a slice at i = 1, i = 6, i = 11, ...
#  # of the inside domain.
#
data_partbuild: begin
data_partbuild: estetdomain inside
data_partbuild: description multiple_iplane_slice_part
data_partbuild: estetnoderange_i 1 1
ndata_partbuild: estetnoderange_j 1 15
ndata_partbuild: estetnoderange_k 1 28
ndata_partbuild: estetstep111
ndata_partbuild: estetdelta 5 0 0
data_partbuild: create
data_partbuild: end
```

See Also:

Associated `data_partbuild` commands
data_partbuild: estetnoderange_i/j/k

Command:

```
data_partbuild: estetnoderange_i <beg> <end>
data_partbuild: estetnoderange_j <beg> <end>
data_partbuild: estetnoderange_k <beg> <end>
```

Purpose:

Specify i, j, or k range values to use when creating a part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>beg</td>
<td>I, J, or K range beginning node plane</td>
</tr>
<tr>
<td></td>
<td>end</td>
<td>I, J, or K range ending node plane</td>
</tr>
</tbody>
</table>

Example Usage:

```
# This will create a slice at i = 1, i = 6, i = 11, ...
# of the inside domain.
# (Note the ranges for each of the ijk directions)
#
data_partbuild: begin
  data_partbuild: estetdomain inside
  data_partbuild: description multiple_iplane_slice_part
  data_partbuild: estetnoderange_i 1 1
  data_partbuild: estetnoderange_j 1 15
  data_partbuild: estetnoderange_k 1 28
  data_partbuild: estetstep 1 1 1
  data_partbuild: estetdelta 5 0 0
  data_partbuild: create
  data_partbuild: end
```

See Also:

Associated data_partbuild commands
data_partbuild: estetstep

Command:

data_partbuild: estetstep <i_step> <j_step> <k_step>

Purpose:

Specify i, j, k step-by values to use in creating an estet part. Values greater than 1 will cause original cells to be combined appropriately into larger elements - producing a coarser grid.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>i_step</td>
<td>step-by value for the I direction</td>
</tr>
<tr>
<td></td>
<td>j_step</td>
<td>step-by value for the J direction</td>
</tr>
<tr>
<td></td>
<td>k_step</td>
<td>step-by value for the K direction</td>
</tr>
</tbody>
</table>

Notes:

This is used when a coarser approximation of the original data is desired. Typically this reduction in the apparent resolution of the model is desired in order to be able to reasonably display very large models.

Example Usage:

```
# This example causes the i and j directions to have cells
# that are made up of 4 original cells each. However, in
# the k direction, the original thickness is retained.
#
data_partbuild: begin
data_partbuild: estetdomain inside
data_partbuild: description coarse_in_ij_part
data_partbuild: estetnoderange_i 1 39
data_partbuild: estetnoderange_j 1 15
data_partbuild: estetnoderange_k 1 28
data_partbuild: estetstep 2 2 1
data_partbuild: estetdelta 0 0 0
data_partbuild: create
data_partbuild: end
```

See Also:

Associated data_partbuild commands
data_partbuild: estetvector_x/y/z

Command:

\[
\begin{align*}
data_partbuild: & \text{ estetvector}_x \ <\text{scalar_name}> \\
data_partbuild: & \text{ estetvector}_y \ <\text{scalar_name}> \\
data_partbuild: & \text{ estetvector}_z \ <\text{scalar_name}> \\
\end{align*}
\]

Purpose:

Specifies the name of the estet scalar variable to use for the vector variable component when build vector variables.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>scalar_name</td>
<td>name of the estet variable that represents a vector component</td>
</tr>
</tbody>
</table>

Example Usage:

\[
\begin{align*}
data_partbuild: & \text{ estetvectordesc} \ \text{velocity} \\
data_partbuild: & \text{ estetvector}_x \ \text{VITESSE}_U \\
data_partbuild: & \text{ estetvector}_y \ \text{VITESSE}_V \\
data_partbuild: & \text{ estetvector}_z \ \text{VITESSE}_W \\
data_partbuild: & \text{ estetbuildvector} \\
\end{align*}
\]

See Also:

Associated data_partbuild commands
Command:

```
data_partbuild: estetvectordesc <desc>
```

Purpose:

Specifies the name for the vector variable will be created with a "data_partbuild: estetbuildvector" command.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>desired name for the vector variable</td>
</tr>
</tbody>
</table>

Example Usage:

```
data_partbuild: estetvectordesc velocity
data_partbuild: estetvector_x VITESSE_U
data_partbuild: estetvector_y VITESSE_V
data_partbuild: estetvector_z VITESSE_W
data_partbuild: estetbuildvector
```

See Also:

Associated `data_partbuild` commands
data_partbuild: iblank_type

Command:

```
data_partbuild: iblank_type <desc>
```

Purpose:

Selects the iblanking type to use when creating unstructured parts from the iblanking of structured parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>description for the iblanking type that is provided to the part building process. (varies for each data format)</td>
</tr>
</tbody>
</table>

Notes:

All data formats that have structured iblanking use this command (estet, plot3d, EnSight6, EnSight Gold, some userd formats, etc). This process requires that a structured part be selected as parent.

Example Usage:

```
# First we create a structured estet part entitled "field"
#
data_partbuild: begin
data_partbuild: estetdomain inside
data_partbuild: description field
data_partbuild: estetnoderange_i 1 39
data_partbuild: estetnoderange_j 1 15
data_partbuild: estetnoderange_k 1 28
data_partbuild: estetstep 1 1 1
data_partbuild: estetdelta 0 0 0
data_partbuild: create
#
# Then we select this as the parent for our ibanked part
#
data_partbuild: select_begin
  1
data_partbuild: select_end
#
# Here we set the description desired and the ibanking type
#
data_partbuild: description symm
data_partbuild: iblank_type Symmetry (4)
#
# And create it
#
data_partbuild: create_iblank
data_partbuild: end
```

See Also:

Associated data_partbuild commands
Command:

```
data_partbuild: mpgsload <option>
```

Purpose:

Specifies the option to use when reading an mpgs data file. All parts will be read. This option controls which parts will be loaded to the client.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td></td>
</tr>
<tr>
<td></td>
<td>all_parts</td>
<td>all parts will be downloaded</td>
</tr>
<tr>
<td></td>
<td>part1_only</td>
<td>part one will be downloaded</td>
</tr>
<tr>
<td></td>
<td>all_but_part1</td>
<td>all but part 1 will be downloaded</td>
</tr>
</tbody>
</table>

Example Usage:

```
# This one is pretty easy, after you specified the data,
# issue the following (or one of the other options)
#
data_partbuild: mpgsload all_parts
```

See Also:

Associated data_partbuild commands
data_partbuild: n3sall_elements

Command:

    data_partbuild: n3sall_elements

Purpose:

    Specifies the "All Elements" process when creating an n3s part.

Parameters:

    none

Notes:

    This process uses all elements, regardless of color or boundary condition tags applied.

Example Usage:

    data_partbuild: begin
    #
    # Creating a part composed of all elements
    #
    data_partbuild: description part_all
    data_partbuild: n3sall_elements
    data_partbuild: create
    #
    # Creating a part based on color number 7
    #
    data_partbuild: description part_color
    data_partbuild: n3scolor_number 7
    data_partbuild: create
    #
    # Creating a part based on boundary condition VITESSE_UX
    #
    data_partbuild: description part_bc
    data_partbuild: n3sboundary
    data_partbuild: n3scondition VITESSE_UX
    data_partbuild: n3scode Free Node
    data_partbuild: create
    data_partbuild: end

See Also:

    Associated data_partbuild commands
Command:

```plaintext
data_partbuild: n3sboundary
```

Purpose:

Specifies the "boundary condition" process when creating an n3s part.

Parameters:

none

Notes:

Needs the "data_partbuild: n3scondition" and "data_partbuild: n3scode" commands as well.

Example Usage:

```plaintext
data_partbuild: begin
#
# Creating a part composed of all elements
#
data_partbuild: description part_all
data_partbuild: n3sall_elements
data_partbuild: create
#
# Creating a part based on color number 7
#
data_partbuild: description part_color
data_partbuild: n3scolor_number 7
data_partbuild: create
#
# Creating a part based on boundary condition VITESSE_UX
#
data_partbuild: description part_bc
ndata_partbuild: n3sboundary
ndata_partbuild: n3scondition VITESSE_UX
ndata_partbuild: n3scode Free Node
ndata_partbuild: create
data_partbuild: end
```

See Also:

Associated data_partbuild commands
data_partbuild: n3scode

Command:

```
data_partbuild: n3scode <desc>
```

Purpose:

Specifies the boundary condition code to use in the "boundary condition" process when creating an N3S part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>The n3s boundary condition code. (the available codes can vary per model) They are typically things like: Free Node Homogeneous Dirichlet Non-homogeneous Dirichlet</td>
</tr>
</tbody>
</table>

Example Usage:

```
data_partbuild: begin
#
# Creating a part composed of all elements
#
data_partbuild: description part_all
data_partbuild: n3sall_elements
data_partbuild: create
#
# Creating a part based on color number 7
#
data_partbuild: description part_color
data_partbuild: n3scolor_number 7
data_partbuild: create
#
# Creating a part based on boundary condition VITESSE_UX
#
data_partbuild: description part_bc
data_partbuild: n3sboundary
data_partbuild: n3scondition VITESSE_UX
data_partbuild: n3scode Free Node
data_partbuild: create
data_partbuild: end
```

See Also:

Associated `data_partbuild` commands
**Command:**

data_partbuild: n3scolor_number <num>

**Purpose:**

Specifies the "color number" process when creating an N3S part.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>node color number to use when creating an N3S part</td>
</tr>
</tbody>
</table>

**Example Usage:**

data_partbuild: begin
  
  # Creating a part composed of all elements
  data_partbuild: description part_all
  data_partbuild: n3sall_elements
  data_partbuild: create

  # Creating a part based on color number 7
  data_partbuild: description part_color
  data_partbuild: n3scolor_number 7
  data_partbuild: create

  # Creating a part based on boundary condition VITESSE_UX
  data_partbuild: description part_bc
  data_partbuild: n3sboundary
  data_partbuild: n3scondition VITESSE_UX
  data_partbuild: n3scode Free Node
  data_partbuild: create
  data_partbuild: end

**See Also:**

Associated data_partbuild commands
data_partbuild: n3scondition

Command:

data_partbuild: n3scondition <desc>

Purpose:

Specifies the boundary condition to use in the "boundary condition" process when creating an N3S part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>N3S boundary condition. (available conditions can vary per model)</td>
</tr>
</tbody>
</table>

Example Usage:

data_partbuild: begin
  #
  # Creating a part composed of all elements
  #
  data_partbuild: description part_all
  data_partbuild: n3sall_elements
  data_partbuild: create
  #
  # Creating a part based on color number 7
  #
  data_partbuild: description part_color
  data_partbuild: n3scolor_number 7
  data_partbuild: create
  #
  # Creating a part based on boundary condition VITESSE_UX
  #
  data_partbuild: description part_bc
  data_partbuild: n3sboundary
  data_partbuild: n3scondition VITESSE_UX
  data_partbuild: n3scode Free Node
  data_partbuild: create
  data_partbuild: end

See Also:

Associated data_partbuild commands
**Command:**

```
data_partbuild: nodedelta <i_del> <j_del> <k_del>
```

**Purpose:**

Specify ijk delta value to use when creating more than one ijk surface from the same ijk block. Only one of the deltas may be non-zero.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>i_del</td>
<td>I, J, K direction delta values</td>
</tr>
<tr>
<td></td>
<td>j_del</td>
<td></td>
</tr>
<tr>
<td></td>
<td>k_del</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

This command is used for EnSight6, EnSight Gold, and User-Defined data formats.

**Example Usage:**

```
data_partbuild: begin
  #
  # Now doing a structured ensight part
  #
data_partbuild: data_type structured
  #
  # Selecting the first part in the
  # structured part building list
  #
data_partbuild: select_begin
  1
  data_partbuild: select_end
  #
  # Setting ijk ranges, step_by, delta values, etc.
  # and creating it. Note the nodedelta and noderange
  # combination used
  #
data_partbuild: domain inside
data_partbuild: noderange_i 1 30
data_partbuild: noderange_j 1 1
data_partbuild: noderange_k 1 30
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 3 0
data_partbuild: description multi_jslice_part
data_partbuild: create
data_partbuild: end
```

**See Also:**

Associated `data_partbuild` commands
data_partbuild: noderange_i/j/k

Command:

\[
data\_partbuild: \ noderange\_i \ \text{<beg>} \ \text{<end>} \\
data\_partbuild: \ noderange\_j \ \text{<beg>} \ \text{<end>} \\
data\_partbuild: \ noderange\_k \ \text{<beg>} \ \text{<end>}
\]

Purpose:

Specify \( i, j, \) or \( k \) range values to use when creating a part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>beg</td>
<td>( i, j, ) or ( K ) range beginning node plane</td>
</tr>
<tr>
<td></td>
<td>end</td>
<td>( i, j, ) or ( K ) range ending node plane</td>
</tr>
</tbody>
</table>

Notes:

This command is used for EnSight6, EnSight Gold, and User-Defined data formats.

Example Usage:

```
data\_partbuild: \begin ich \\
# \\
# Now doing a structured ensight part \\
# \\
data\_partbuild: \ data\_type \ structured \\
# \\
# Selecting the first part in the \\
# structured part building list \\
# \\
data\_partbuild: \ select\_begin \\
1 \\
data\_partbuild: \ select\_end \\
# \\
# Setting \( ijk \) ranges, step_by, delta values, etc. \\
# and creating it. Note the nodeDelta and noderange \\
# combination used \\
# \\
data\_partbuild: \ domain \ inside \\
data\_partbuild: \ noderange\_i \ 1 \ 30 \\
data\_partbuild: \ noderange\_j \ 1 \ 1 \\
data\_partbuild: \ noderange\_k \ 1 \ 30 \\
data\_partbuild: \ nodestep \ 1 \ 1 \ 1 \\
data\_partbuild: \ nodeDelta \ 0 \ 3 \ 0 \\
data\_partbuild: \ description \ multi\_jslice\_part \\
data\_partbuild: \ create \\
data\_partbuild: \ end
```

See Also:

Associated data_partbuild commands
Command:

```
data_partbuild: nodestep <i_step> <j_step> <k_step>
```

Purpose:

Specify i, j, k step-by values to use in creating a structured part. Values greater than 1 will cause original cells to be combined appropriately into larger elements - producing a coarser grid.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>i_step</td>
<td>step-by value for the I, J, K directions</td>
</tr>
<tr>
<td></td>
<td>j_step</td>
<td></td>
</tr>
<tr>
<td></td>
<td>k_step</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This command is used for EnSight6, EnSight Gold, and User-Defined data formats. This is used when a coarser approximation of the original data is desired. Typically this reduction in the apparent resolution of the model is desired in order to be able to reasonably display very large models.

Example Usage:

```
# This example causes the i and j directions to have cells
# that are made up of 4 original cells each. However, in
# the k direction, the original thickness is retained.
#
# data_partbuild: begin
data_partbuild: domain all
data_partbuild: description coarse_in_ij_part
data_partbuild: noderange_i 1 39
data_partbuild: noderange_j 1 15
data_partbuild: noderange_k 1 28
data_partbuild: nodestep 2 2 1
data_partbuild: nodedelta 0 0 0
data_partbuild: create
data_partbuild: end
```

See Also:

Associated `data_partbuild` commands
data_partbuild: select_begin/end

**Command:**

```plaintext
data_partbuild: select_begin
<part1, part2, ... partN>
data_partbuild: select_end
```

**Purpose:**

Specify parts, from the part build lists, to use in the part build process.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>partN</td>
<td>number of the part in the list of available parts in the model data file(s)</td>
</tr>
</tbody>
</table>

**Notes:**

These commands are used by all iblanked structured formats when doing create_iblank process. They are also used by EnSight6, EnSight Gold, and User-Defined formats when selecting parent parts.

**Example Usage:**

```plaintext
data_partbuild: begin
#
# Doing a structured ensight part
#
data_partbuild: data_type structured
#
# Selecting the first part in the
# structured part building list
#
data_partbuild: select_begin
1
data_partbuild: select_end
#
# Setting ijk ranges, step_by, delta values, etc.
# and creating it.
#
data_partbuild: domain inside
data_partbuild: noderange_i 1 3
data_partbuild: noderange_j 1 3
data_partbuild: noderange_k 1 3
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description my_inside_part
data_partbuild: create
data_partbuild: end
```

**See Also:**

Associated `data_partbuild` commands
Commands in this Section:

devsrf

devsrf: axis <dx> <dy> <dz>
devsrf: begin
devsrf: end
devsrf: create
devsrf: origin <x_comp> <y_comp> <z_comp>
devsrf: projection <type>
devsrf: scale_factor_u <factor>
devsrf: scale_factor_v <factor>
devsrf: seam_vector <x_comp> <y_comp> <z_comp>
devsrf: select_default

See Also:

User Manual - Section 7.9, Developed Surface Create/Update
How To Create Developed (Unrolled) Surfaces
devsrf: axis

Command:

`devsrf: axis <dx> <dy> <dz>`

Purpose:

Specifies the direction of the axis of revolution, or longitudinal axis, of the revolved part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>dx</td>
<td>cartesian vector x, y, z components of the developing cylinder's longitudinal axis</td>
</tr>
<tr>
<td></td>
<td>dy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>dz</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This vector corresponds to the direction of the axis of revolution of the cylinder, cone, sphere, or revolution tool for any revolved surface created via these quadric tools. Otherwise, this vector should be specified to coincide with the axis of revolution of the 2D parent part.

This is the longitudinal axis about which the nodes of the selected part(s) are mapped to the computational developing cylinder; which cylinder is subsequently unrolled yielding the developed (unrolled) surface.

Example Usage:

```
devsrf: select_default
part: modify_begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
part: modify_end
```

See Also:

Associated `devsrf` commands
Command:

```plaintext
devsrf: begin
<command list>
devsrf: end
```

Purpose:

A wrapper command construct that contains the appropriate developed surface attribute commands used to create a (2D) developed surface part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>command</td>
<td>command list</td>
<td>appropriate devsrf commands that affect the creation of the developed surface part - see Example Usage below</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
part: select_begin
2
part: select_end
devsrf: begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
devsrf: end
devsrf: create
```

See Also:

Associated `devsrf` commands
devsrf: create

Command:

devsrf: create

Purpose:

Specifies the creation of a developed, or unrolled surface. This unrolls the selected 2D (parent) part into a flat2D developed part.

Parameters:

none

Notes:

In the example below, the 2 in the 2D parent part 2 is unrolled into the 2D developed part 3.

Example Usage:

```
# # Align default settings according to parent part
#
part: select_begin
  2
part: select_end
devsrf: select_default
part: modify_begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
part: modify_end
#
# Create developed part 3 from parent part 2
#
part: select_begin
  2
part: select_end
devsrf: begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
devsrf: end
devsrf: create
```

See Also:

Associated devsrf commands
Command:

\texttt{devsrf: origin \textless x\textunderscore comp \textgreater\  \textless y\textunderscore comp \textgreater\  \textless z\textunderscore comp \textgreater}

Purpose:

Specifies an origin which lies on the axis of revolution, or the longitudinal axis of the developing cylinder.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>\texttt{x_comp}</td>
<td>\texttt{y_comp}</td>
<td>\texttt{z_comp}</td>
</tr>
<tr>
<td></td>
<td>x, y, z components of the origin of the developing cylinder (located on the longitudinal axis) in model coordinates</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This point corresponds to the origin of the cylinder, cone, sphere, or revolution tool for any revolved surface created via these quadric tools. Otherwise, this point locates the axis of revolution of the 2D parent part.

Example Usage:

```
# Modify the default
#
# devsrfs: select_default
part: modify_begin
  devsrfs: origin 5.0000e-01 5.0000e-01 0.0000e+00
  devsrfs: axis 0.0000e+00 0.0000e+00 1.0000e+00
  devsrfs: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
part: modify_end
```

See Also:

Associated \texttt{devsrfs} commands
devsrf: projection

Command:

devsrf: projection <type>

Purpose:

Specifies the type of coordinate projection, or mapping, that the developed surface part represents.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>Includes the following types of coordinate projections, or mapping, in (abscissa, ordinate) frame of reference:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>r,z a (radial, z-direction) coordinate system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>theta,z a (theta, z-direction) coordinate system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>m,theta a (meridian, theta) coordinate system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>m,r a (meridian, radial) coordinate system</td>
</tr>
<tr>
<td></td>
<td></td>
<td>theta,r a (theta, radial) coordinate system</td>
</tr>
</tbody>
</table>

Notes:

The meridional component is defined as m = SQRT(r^2 + z^2).

The default projection is (theta,z).

Example Usage:

```plaintext
part: select_begin 3
part: select_end
part: modify_begin
devsrf: projection m,theta
part: modify_end
viewport: select_begin 1
viewport: select_end
```

See Also:

Associated `devsrf` commands
Command:

```
devsrf: scale_factor_u <factor>
devsrf: scale_factor_v <factor>
```

Purpose:

Specifies the scale factor applied to the abscissa/ordinate component of the projection type of the developed part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>factor</td>
<td>scale factor applied to the abscissa/ordinate of the developed surface projection</td>
</tr>
</tbody>
</table>

Notes:

Default scale factor for both u and v is 1.

Example Usage:

```
part: select_begin
  1
part: select_end
part: modify_begin
  devsrf: scale_factor_u 5.0000e-01
  devsrf: scale_factor_v 2.0000e+00
part: modify_end
```

See Also:

Associated `devsrf` commands
devsrf: seam_vector

Command:

\texttt{devsrf: seam\_vector <x\_comp> <y\_comp> <z\_comp>}

Purpose:

Specifies the vector perpendicular to the axis of revolution which points in the direction of the seam line.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>cartesian x, y, z vector components of a vector perpendicular to and starting from the axis of revolution and pointing to the seam line</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This vector does not specify the actual direction of the seam line by which the surface is split. Rather it indirectly specifies the location of the seam line via defining a vector perpendicular to and emanating from the axis of revolution which points to the seam (and thus, is consequently perpendicular to the seam).

Example Usage:

```plaintext
#  # Modify the default  #
#  devsrf: select\_default
part: modify\_begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam\_vector 1.0000e+00 0.0000e+00 0.0000e+00
part: modify\_end
```

See Also:

Associated devsrf commands
Command:

```plaintext
devsrf: select_default
```

Purpose:

Specifies the default origin, axis (of rotation), and seam vector to align according to the longitudinal axis of the selected part.

Parameters:

none

Notes:

This command facilitates a method for the origin, axis, and seam vector to inherit the position and direction of the longitudinal axis of the 2D parent part.

Example Usage:

```plaintext
devsrf: select_default
part: modify_begin
devsrf: origin 5.0000e-01 5.0000e-01 0.0000e+00
devsrf: axis 0.0000e+00 0.0000e+00 1.0000e+00
devsrf: seam_vector 1.0000e+00 0.0000e+00 0.0000e+00
part: modify_end
```

See Also:

Associated `devsrf` commands
devsr: select_default
Commands in this Section:

elevsurf

elevsurf: begin
   elevsurf: end
   elevsurf: component <x_scal> <y_scal> <z_scal>
   elevsurf: create
   elevsurf: offset <offset_val>
   elevsurf: scale_factor <scale>
   elevsurf: select_default
   elevsurf: sidewall <toggle>
   elevsurf: surface <toggle>
   elevsurf: variable <variable_name>

See Also:

User Manual - Section 7.7, Elevated Surface Create/Update
How To Create Elevated Surfaces
Command:

```
elevsurf: begin
elevsurf: end
```

Purpose:

Delimit the modifications for elevated surface parts.

Parameters:

none

Notes:

These commands are used to set the attributes for an elevated surface part creation.

Example Usage:

```
# # Select parent #
part: select_begin
  2
part: select_end
#
# # Set the attributes #
elevsurf: begin
elevsurf: variable N_temperature
elevsurf: offset 0.0000e+00
elevsurf: scale_factor 2.0750e-02
elevsurf: sidewall ON
elevsurf: surface ON
elevsurf: end
elevsurf: create
```

See Also:

Associated `elevsurf` commands
Command:

elevsurf: component <x_scal> <y_scal> <z_scal>

Purpose:

Elevated surfaces are always created with a scalar. If creation variable is a vector this command specifies how the scalar will be created.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_sca</td>
<td>scale factor to apply to the x, y, z components of the vector</td>
</tr>
<tr>
<td></td>
<td>y_sca</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_sca</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

If all the scale factors are set to 0.0, the magnitude of the vector will be used (this is the default).

Example Usage:

# Select existing elevated surface part
# part: select_begin
    3
  part: select_end
  part: modify_begin
  elevsurf: variable N_velocity
    #
    # Use x-component of the vector
    #
  elevsurf: component 1.0000e+00 0.0000e+00 0.0000e+00
  elevsurf: scale_factor 9.9660e-01
  part: modify_end

See Also:

Associated elevsurf commands
elevsurf: create

Command:

```
elevsurf: create
```

Purpose:

Create an elevated surface according to specified or default attributes.

Parameters:

none

Example Usage:

```
# Select parent part
#
part: select_begin
  2
part: select_end

elevsurf: begin
  elevsurf: variable N_temperature
  elevsurf: offset 0.0000e+00
  elevsurf: scale_factor 2.0750e-02
  elevsurf: sidewall ON
  elevsurf: surface ON
  elevsurf: end

elevsurf: create
```

See Also:

Associated `elevsurf` commands
Command:

    elevsurf: offset <offset_val>

Purpose:

Specifies a value that is added to the variable values before the scale factor is applied. Has the effect of moving the surface basis relative to the model.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset_val</td>
<td>value that is applied to the variable values before scaling.</td>
</tr>
</tbody>
</table>

Example Usage:

```c
# Select existing elevated surface part
#
part: select_begin
  3
part: select_end
part: modify_begin
elevsurf: variable N_velocity
elevsurf: component 1.0000e+00 0.0000e+00 0.0000e+00
elevsurf: scale_factor 9.9660e-01
elevsurf: offset 1.5000e+00
part: modify_end
```

See Also:

Associated elevsurf commands
### elevsurf: scale_factor

**Command:**

```
elevsurf: scale_factor <scale>
```

**Purpose:**

Specifies the scale factor to apply to the variable for the elevated surface.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale</td>
<td>scale factor to apply to variable values</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
# Select existing elevated surface part
# part: select_begin
  3
part: select_end
part: modify_begin
elevsurf: variable N_velocity
elevsurf: component 1.0000e+00 0.0000e+00 0.0000e+00
elevsurf: scale_factor 9.9660e-01
elevsurf: offset 1.5000e+00
part: modify_end
```

**See Also:**

Associated `elevsurf` commands
Command:

elevsurf: select_default

Purpose:
Set elevated surface selection to none, so that subsequent elevated surface attribute commands will apply to the defaults.

Parameters:

none

Notes:
The defaults are used for future elevated surface creations.

Example Usage:

elevsurf: select_default
part: modify_begin
elevsurf: scale_factor 3.0750e-02
part: modify_end

See Also:
Associated elevsurf commands
elevsurf: sidewall

Command:

\texttt{elevsurf: sidewall <toggle>}

Purpose:

Specifies whether the elevated sidewalls will be created.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command is used in conjunction with "elevsurf: surface", to achieve the combinations of surface and sidewall, surface only, or sidewalls only.

Example Usage:

```
# Select parent part
#
part: select_begin
  2
part: select_end

elevsurf: begin

elevsurf: variable N_temperature

elevsurf: offset 0.0000e+00

elevsurf: scale_factor 2.0750e-02

elevsurf: sidewall ON

elevsurf: surface ON

elevsurf: end

elevsurf: create
```

See Also:

Associated elevsurf commands
Command:

elevsurf: surface <toggle>

Purpose:

Specifies whether the elevated surface itself will be displayed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command is used in conjunction with "elevsurf: sidewall", to achieve the combinations of surface and sidewall, surface only, or sidewalls only.

Example Usage:

```plaintext
# Select parent part
#
part: select_begin
  2
part: select_end
elevsurf: begin
elevsurf: variable N_temperature
elevsurf: offset 0.0000e+00
elevsurf: scale_factor 2.0750e-02
elevsurf: sidewall ON
elevsurf: surface ON
elevsurf: end
elevsurf: create
```

See Also:

Associated elevsurf commands
**elevsurf: variable**

**Command:**

```
elevsurf: variable <variable_name>
```

**Purpose:**

Assigns the variable to use for the creation of an elevated surface.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the variable to use</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
# Select parent part
part: select_begin
2
part: select_end
elevsurf: begin
elevsurf: variable N_temperature
elevsurf: offset 0.0000e+00
elevsurf: scale_factor 2.0750e-02
elevsurf: sidewall ON
elevsurf: surface ON
elevsurf: end
elevsurf: create
```

**See Also:**

Associated `elevsurf` commands
Commands in this Section:

file

file: image_color_type <color_type>
file: image_convert <toggle>
file: image_encapsulated <toggle>
file: image_envideo_type <compression_type>
file: image_file <filename>
file: image_format <image_format>
file: image_gamma <gamma_value>
file: image_orientation <orientation>
file: image_plot_only <toggle>
file: image_postscript_cull <toggle>
file: image_postscript_prev <toggle>
file: image_postscript_subd <toggle>
file: image_postscript_type <ps_type>
file: image_printer_command <command>
file: image_printer_model <printer>
file: image_quality <quality>
file: image_saturation <sat_value>
file: image_scale_factor <scale_value>
file: image_to_file <toggle>
file: image_to_printer <toggle>
file: image_window_size <window_sz>
file: image_window_xy <width> <height>
file: restore_context <filename>
file: restore_full_backup <filename>
file: save_context <filename>
file: save_context_type <type>
file: save_full_backup <filename>
file: save_image <filename>
file: save_multiple_images <toggle>
file: save_scenario_file <filename>
file: save_scenario_project <directory_name>
file: save_scenario_view <filename> <viewname>
file: scenario_desc_begin
file: scenario_desc_end
file: scenario_flipbook_anim <toggle>
file: scenario_keyframe_anim <toggle>
file: scenario_trace_anim <toggle>

See Also:

User Manual - Section 6.1, File Menu Functions
How To Save and Restore an Archive
How To Print/Save and Image
How To Save/Restore Context
How To Save Scenario
### file: image_color_type

**Command:**

```plaintext
file: image_color_type <color_type>
```

**Purpose:**

Specify that the image will be printed in color or black and white

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>color_type</td>
<td>color, if the image should be printed in color</td>
</tr>
<tr>
<td></td>
<td>black&amp;white</td>
<td>black and white, if image should be printed in grayscale</td>
</tr>
</tbody>
</table>

**Notes:**

All formats support this parameter except TIFF and EnVideo

**Example Usage:**

```plaintext
file: image_format jpeg
file: image_color_type black&white
file: image_file /tmp/test_image
file: save_image
gg
```

**See Also:**

Associated file commands
Command:

```
file: image_convert <toggle>
```

Purpose:

Change black backgrounds to white and change any white objects (geometry, plotters, annotations, etc.) to black.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to change to white background with black foreground.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to change back to the original colors.</td>
</tr>
</tbody>
</table>

Example Usage:

```
file: image_format sgi_rgb
file: image_file /tmp/test_image
file: image_convert ON
file: save_image
file: image_convert OFF
```

See Also:

Associated file commands
**file: image_encapsulated**

**Command:**

```
file: image_encapsulated <toggle>
```

**Purpose:**

Turn on/off encapsulation for postscript output

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to include encapsulation information in the print output.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF (default) will produce print output without the encapsulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>information.</td>
</tr>
</tbody>
</table>

**Notes:**

Encapsulation should only be used when the resulting image file will be used as part of another document. Printers do not normally interpret encapsulated image files.

**Example Usage:**

```
file: image_format postscript
file: image_color_type black&white
file: image_file /tmp/test_image
file: image_orientation landscape
file: image_encapsulated ON
file: save_image
```

**See Also:**

Associated file commands
**Command:**

```
file: image_envideo_type <compression_type>
```

**Purpose:**

Set the envideo format compression scheme.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>compression_type</td>
<td>rle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>jpeg</td>
</tr>
</tbody>
</table>

**Notes:**

rle is a lossless compression scheme, though it produces larger files than jpeg. If the compression scheme is jpeg, "file: image_quality" controls the jpeg compression/quality.

**Example Usage:**

```
file: image_format envideo
file: image_envideo_type jpeg
file: image_quality 80
file: image_file /tmp/test_image
file: save_image
```

**See Also:**

Associated file commands
**file: image_file**

**Command:**

```
file: image_file <filename>
```

**Purpose:**

Specify the filename to be used for image printing.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the image file to be saved</td>
</tr>
</tbody>
</table>

**Notes:**

Must be specified before a "file: save_image" if "file: image_to_file" is ON.

**Example Usage:**

```
file: image_format jpeg
file: image_file /tmp/test_image
file: save_image
```

**See Also:**

Associated file commands
Command:

    file: image_format <image_format>

Purpose:

Specifies the file format to be used when an image is created.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>image_format</td>
<td>The image format which must be one of: pict, jpeg, tiff, pcl, postscript, sgi_rgb, targa, cei_rgbz, envideo, mpeg, avi</td>
</tr>
</tbody>
</table>

Notes:

If the image is saved to a disk file the filename is concatenated with an extension as follows:

    pict-.pct
    jpeg-.jpg
    tiff-.tif
    pcl-.pcl
    postscript-.ps
    encapsulated ps -.eps
    sgi_rgb-.rgb
    targa-.tga
    cei_rgbz-.rgbz
    envideo-.evo
    mpeg-.mpg
    avi-.avi

Example Usage:

    file: image_format jpeg
    file: image_file /tmp/test_image
    file: save_image

See Also:

Associated file commands
file: image_gamma

Command:

    file: image_gamma <gamma_value>

Purpose:

Set gamma correction value for PCL image files.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>gamma_value</td>
<td>The range is dependent on the system. Typically values are on the order (1 \leq \gamma \leq 3).</td>
</tr>
</tbody>
</table>

Notes:

Gamma corrects for monitor/printer non-linearities for color saturation/brightness. For example, without gamma correction, a full intensity red pixel will not be twice as bright as a half intensity pixel. 1.0 is the default and is used if not specified.

Example Usage:

    file: image_format pcl
    file: image_gamma 1.7
    file: image_printer_model DeskJet_1200c
    file: image_file /tmp/test_image
    file: save_image

See Also:

Associated file commands
Command:

```
file: image_orientation <orientation>
```

Purpose:
Sets the image orientation for PCL and Postscript image formats

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>orientation</td>
<td>portrait to print image in portrait layout</td>
</tr>
<tr>
<td></td>
<td></td>
<td>landscape to print image in landscape layout</td>
</tr>
</tbody>
</table>

Notes:
"portrait" is used if not specified.

Example Usage:
```
file: image_format postscript
file: image_color_type black&white
file: image_file /tmp/test_image
file: image_orientation landscape
file: save_image
```

See Also:
Associated file commands
Command:

    file: image_plot_only <toggle>

Purpose:

When printing an image will turn invisible everything except for plotters.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to save a view with plotters only</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for normal “show everything” operation</td>
</tr>
</tbody>
</table>

Notes:

If turned ON, should be turned OFF after a "file: save_image"

Example Usage:

    file: image_format jpeg
    file: image_quality 80
    file: image_file /tmp/test_image
    file: image_plot_only ON
    file: save_image
    file: image_plot_only OFF

See Also:

Associated file commands
Command:

```
file: image_postscript_cull <toggle>
```

Purpose:

For postscript format move-draw images turns on/off the removal of hidden geometry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON   to remove hidden geometry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF  to keep all geometry</td>
</tr>
</tbody>
</table>

Notes:

Culling hidden geometry can vastly improve printer performance and reduce file size. However, processing time is significantly higher.

When OFF the geometry will be drawn from back to front.

The default is ON.

Example Usage:

```
file: image_format postscript
file: image_postscript_type move_draw
file: image_postscript_cull OFF
file: image_file /tmp/test_image
file: save_image
```

See Also:

Associated file commands
**file: image_postscript_prev**

**Command:**

```
file: image_postscript_prev <toggle>
```

**Purpose:**

Include a windows preview image in an encapsulated postscript (eps) file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON      if file will include a preview image</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF     if file will not include a preview image</td>
</tr>
</tbody>
</table>

**Notes:**

If a preview image is not included a EPS file will be shown as a grey rectangle in Windows applica-
tions. Many applications which can normally read a EPS file will not be able to read one which
includes a windows preview image.

**Example Usage:**

```
file: image_format postscript
file: image_encapsulated ON
file: image_postscript_prev ON
file: image_file /tmp/test_image
file: save_image
```

**See Also:**

Associated file commands
Command:

```
file: image_postscript_subd <toggle>
```

Purpose:

For postscript format move-draw images turns on/off the subdivision of polygons for better shading.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> to turn on polygon subdivision</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> to turn off polygon subdivision</td>
</tr>
</tbody>
</table>

Notes:

The postscript format supports only a single color per polygon. Lighting and false color mapping will look poor unless the polygon is subdivided into smaller (single color) regions. The default is **ON**.

Example Usage:

```
file: image_format postscript
file: image_postscript_type move_draw
file: image_postscript_subd ON
file: image_file /tmp/test_image
file: save_image
```

See Also:

Associated file commands
**file: image_postscript_type**

**Command:**

```
file: image_postscript_type <ps_type>
```

**Purpose:**

Set the postscript output to move-draw or bitmap.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>ps_type</td>
<td>move_draw</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for move-draw mode</td>
</tr>
<tr>
<td></td>
<td>image_pixels</td>
<td>image_pixels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for bitmap mode</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
file: image_format postscript
file: image_file /tmp/test_image
file: image_postscript_type image_pixels
file: save_image
```

**See Also:**

Associated file commands
**Command:**

```
file: image_printer_command <command>
```

**Purpose:**

Specify the printer command to use when printing an image to a printer

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>command</td>
<td>printer command used to print the image</td>
</tr>
</tbody>
</table>

**Notes:**

You can print an image straight to a printer only if the printer can properly interpret the image file. Many printers will, for example, properly print a postscript file. Printing a PICT file, however, will usually result in multiple pages of non-printable characters.

**Example Usage:**

```
file: image_format postscript
file: image_to_file OFF
file: image_to_printer ON
file: image_printer_command lpr -Pcolor
file: save_image
```

**See Also:**

Associated file commands
**file: image_printer_model**

**Command:**

`file: image_printer_model <printer>`

**Purpose:**

Set the target printer for a PCL image file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>printer</td>
<td>One of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_500+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laser Jet II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_IIP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_III</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LaserJet_4L</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DeskJet_500</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DeskJet_500c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DeskJet_550</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DeskJet_550c</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DeskJet_1200c</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
file: image_format pcl
file: image_printer_model DeskJet_1200c
file: image_file /tmp/test_image
file: save_image
```

**See Also:**

Associated `file` commands
Command:

file: image_quality <quality>

Purpose:

Sets the quality for JPEG images.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>quality</td>
<td>0 &lt;= quality &lt;= 100</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 is the highest quality (no compression)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 is the lowest quality (highest compression)</td>
</tr>
</tbody>
</table>

Notes:

JPEG is a lossy format, i.e., it trades off file size for quality. Normally a quality factor of around 80 will produce a file that will be on order 2X smaller than one produced with a quality factor set to 100 with negligible impact on quality. JPEG format is best used with shaded images.

Example Usage:

file: image_format jpeg
file: image_quality 80
file: image_file /tmp/test_image
file: save_image

See Also:

Associated file commands
file: image_saturation

Command:

    file: image_saturation <sat_value>

Purpose:

Desaturate color when saving an image to disk or printer.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>sat_value</td>
<td>A value from 0 (black and white) to 1 (full color saturation)</td>
</tr>
</tbody>
</table>

Notes:

Desaturating images is especially useful when saving images to a format which will be played back on a television monitor as fully saturated colors have a tendency to "bleed". 1.0 is the default and is used if not specified.

Example Usage:

    file: image_format sgi_rgb
    file: image_saturation 0.8
    file: image_file /tmp/test_image
    file: save_image

See Also:

Associated file commands
**Command:**

```
file: image_scale_factor <scale_value>
```

**Purpose:**

To scale a postscript image for the page size.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale_value</td>
<td>a value from 0 to 1 specifying portion of the page to use for printing</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
file: image_format postscript
file: image_color_type black&white
file: image_file /tmp/test_image
file: image_orientation landscape
file: image_scale_factor .5
file: save_image
```

**See Also:**

Associated file commands
file: image_to_file

Command:

\[
\text{file: image_to_file } <\text{toggle}>
\]

Purpose:

Specifies if the image should be saved to a disk file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

If flag is set to \text{OFF}, the other choice, printing the image directly to a printer should be specified. If \text{ON} the "file: image_file" command should be specified. The default is \text{ON}, i.e., this command does not have to be specified if printing an image to a file.

Example Usage:

\[
\begin{align*}
\text{file: image_format jpeg} \\
\text{file: image_to_file ON} \\
\text{file: image_file /tmp/test_image} \\
\text{file: save_image}
\end{align*}
\]

See Also:

Associated file commands
Command:

file: image_to_printer <toggle>

Purpose:

Specifies if the image should be printed directly to a printer.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON if the image should be printed directly to a printer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF if the image should not be printed to a printer</td>
</tr>
</tbody>
</table>

Notes:

If flag is set to OFF, the other choice, printing the image to a disk file should be specified. If ON, the "file: image_printer_command" should be specified.

Example Usage:

file: image_format jpeg
file: image_to_file OFF
file: image_to_printer ON
file: image_printer_command lpr -Pprinter
file: save_image

See Also:

Associated file commands
**file: image_window_size**

**Command:**

```plaintext
file: image_window_size <window_sz>
```

**Purpose:**

When printing image based images sets the window (and thus image) size.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>window_sz</td>
<td>normal to use the current graphics window size</td>
</tr>
<tr>
<td></td>
<td>full</td>
<td>to use a full screen size window</td>
</tr>
<tr>
<td></td>
<td>User_defined</td>
<td>to specify the size of the window</td>
</tr>
<tr>
<td></td>
<td>detached_display</td>
<td>use the detached display, as specified by the -dconfig command line argument</td>
</tr>
</tbody>
</table>

**Notes:**

When an image is saved a new window will be created of the size specified. The default is normal.

**Example Usage:**

```plaintext
file: image_format sgi_rgb
detached_display
file: image_window_size full
detached_display
file: image_file /tmp/test_image
detached_display
file: save_image
detached_display
```

**See Also:**

Associated file commands
Command:

    file: image_window_xy <width> <height>

Purpose:

Sets the image width and height if the user has specified a user_defined image size.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>width</td>
<td>pixels in x direction</td>
</tr>
<tr>
<td></td>
<td>height</td>
<td>pixels in y direction</td>
</tr>
</tbody>
</table>

Notes:

For interactive processing width and height are limited to the size of the managed display area. For batch rendering width and height are limited to 15360 x 4096.

If the aspect ratio of EnSight's graphics area does not match the specified values the resulting image will not match what is currently displayed. To avoid this problem the specified aspect ratio (width/height) must match what is currently in use. To find the currently in use values enter "test: size_of_window" in the command dialog. The currently in use values will be printed in the EnSight shell window.

Example Usage:

    file: image_format sgi_rgb
    file: image_window_size user_defined
    file: image_window_xy 800 600
    file: image_file /tmp/test_image
    file: save_image

See Also:

Associated file commands
file: restore_context

Command:

\texttt{file: restore\_context <filename>}

Purpose:

Restore a context file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the context file to restore</td>
</tr>
</tbody>
</table>

Notes:

If a context file is restored before data is read the data used to create the context file is also restored together with the parts that existed at the time the context file was saved.

If a context file is restored after data is read but before parts are created the same parts that existed in the context file will be restored.

If a context file is restored after data and parts have been loaded, the context content is applied towards the loaded parts. In this case the part names must match. If part names do not match the user must manually match up the parts via a pop-up dialog.

Example Usage:

\texttt{ensight7 -ctx /tmp/test.ctx}

See Also:

Associated file commands
**Command:**

`file: restore_full_backup <filename>`

**Purpose:**

Restore an EnSight archive (restart) file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the EnSight archive file</td>
</tr>
</tbody>
</table>

**Notes:**

The file specified must be located on the EnSight client machine.

The file specified contains the file names of the archive files for both the client and server machines.

When an EnSight archive file is restored, the EnSight command file used to generate the archive file is also restored. The command file is named `ensig********.restore` and is usually located in `/usr/tmp` (UNIX) or the user’s home directory (windows). The restored command file contains the commands from the last EnSight session. In the case where the session was started with an archive restore, the command file will not be complete.

Archive files are usually not compatible between major EnSight releases and are usually not portable between machines. Should the restore of an archive fail, the user should consider using the command file mentioned above.

**Example Usage:**

`file: restore_full_backup /tmp/test.ar`

**See Also:**

Associated file commands
file: save_context

Command:

    file: save_context <filename>

Purpose:

Save a context file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the context file</td>
</tr>
</tbody>
</table>

Notes:

A context file provides a data independent way to apply a visualization to a new dataset.

The context file consists, at minimum, of a file containing the commands to recreate the visuals on the screen that existed at the time the context was saved.

The filename is used as a root name as multiple files are saved including the palette, view, and keyframe animation state.

Context files are not portable between big/little endian machines at this time.

Example Usage:

    file: save_context /tmp/test.ctx

See Also:

Associated file commands
Command:

```
file: save_context_type <type>
```

Purpose:

Can specify the desired case to use, or all cases, when saving a context file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>all_cases</td>
<td>A context file will be saved for each case</td>
</tr>
<tr>
<td></td>
<td>current_case</td>
<td>A context file will be saved for the current case</td>
</tr>
</tbody>
</table>

Example Usage:

```
file: save_context_type all_cases
file: save_context myfile.ctx
```

See Also:

Associated file commands
file: save_full_backup

Command:

    file: save_full_backup <filename>

Purpose:

    Create an EnSight archive (restart) file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the EnSight archive file</td>
</tr>
</tbody>
</table>

Notes:

    Three files are actually written. The file name specified contains the name of the other two files and is written on the EnSight client machine. Besides the file specified, one file is written on the EnSight client and server machines containing the archive information.

    Archive files are usually not compatible between major EnSight releases and are usually not portable between machines.

Example Usage:

    file: save_full_backup /tmp/test.ar

See Also:

    Associated file commands
Command:

```
file: save_image <filename>
```

Purpose:

Save an image to a disk file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>filename to save the image to</td>
</tr>
</tbody>
</table>

Example Usage:

```
file: image_format jpeg
file: image_file /tmp/test_image
file: save_image
```

See Also:

Associated file commands
file: save_multiple_images

Command:

    file: save_multiple_images <toggle>

Purpose:

Option to save a single image or multiple images for a flat-wall detached display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

When saving a flat-wall detached display, the user can choose to write one large image for the wall or one image per ‘pipe’ from the dconfig file. This option is only valid when the image size is detached_display.

Example Usage:

    file: image_window_size detached_display
    file: save_multiple_images ON
    file: image_file prefix

See Also:

Associated file commands
file: save_scenario_file

Command:

    file: save_scenario_file <filename>

Purpose:

    Save a scenario file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the file to use for the scenario information</td>
</tr>
</tbody>
</table>

Notes:

    A scenario can be restored in EnLiten.
    A scenario file contains information to completely restore the current visuals in EnLiten.
    A scenario project contains additional information.

Example Usage:

    file: save_scenario_file /tmp/test_scenario_file

See Also:

    Associated file commands
**file: save_scenario_project**

**Command:**

```
file: save_scenario_project <directory_name>
```

**Purpose:**

Save a scenario project.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>directory_name</td>
<td>name of the directory to save the scenario information</td>
</tr>
</tbody>
</table>

**Notes:**

A scenario can be restored in EnLiten.

A scenario file contains information to completely restore the current visuals in EnLiten.

A scenario project contains a scenario file plus (a) a JPEG image file of what the project looks like, (b) a file containing the scenario description, and (c) an EnSight context file (can be multiple files).

The scenario file and associated project files will be named using the `directory_name` as the root filename.

**Example Usage:**

```
file: save_scenario_project /tmp/test_scenario_project
```

**See Also:**

Associated file commands
Command:

`file: save_scenario_view <filename> <viewname>`

Purpose:

Save a view as part of an existing scenario file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the existing scenario file</td>
</tr>
<tr>
<td></td>
<td>viewname</td>
<td>a description for the view</td>
</tr>
</tbody>
</table>

Example Usage:

- `file: save_scenario_project /tmp/test_scenario_file`
- `file: save_scenario_view /tmp/test_scenario_file top_view`

See Also:

Associated `file commands`
file: scenario_desc_begin/end

Command:

```plaintext
file: scenario_desc_begin
file: scenario_desc_end
```

Purpose:

Delimit the description for a scenario project.

Parameters:

none

Notes:

A scenario project contains descriptions of the project suitable for inclusion in HTML documents.

Example Usage:

```plaintext
file: scenario_desc_begin
This project contains multiple studies from 2001
file: scenario_desc_end
file save_scenario_project /tmp/test_project
```

See Also:

Associated file commands
Command:

```
file: scenario_flipbook_anim <toggle>
```

Purpose:

When a scenario file/project is saved will determine if flipbook animation (if defined) will be included.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>if flipbook animations are to be included</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>if flipbook animations are not to be included</td>
</tr>
</tbody>
</table>

Notes:

The default is ON

Example Usage:

```
file: scenario_flipbook_anim ON
file: save_scenario_file /tmp/test_scenario
```

See Also:

Associated file commands
**file: scenario_keyframe_anim**

**Command:**

```
file: scenario_keyframe_anim <toggle>
```

**Purpose:**

When a scenario file/project is saved will determine if keyframe animation (if defined) will be included.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> if keyframe animations are to be included</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> if keyframe animations are not to be included</td>
</tr>
</tbody>
</table>

**Notes:**

The default is **ON**.

**Example Usage:**

```
file: scenario_keyframe_anim ON
file: save_scenario_file /tmp/test_scenario
```

**See Also:**

Associated file commands
Command:

```
file: scenario_trace_anim <toggle>
```

Purpose:

When a scenario file/project is saved will determine if particle trace animation (if defined) will be included.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON if particle trace animations are to be included</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF if particle trace animations are not to be included</td>
</tr>
</tbody>
</table>

Notes:

The default is ON.

Example Usage:

```
file: scenario_trace_anim ON
file: save_scenario_file /tmp/test_scenario
```

See Also:

Associated file commands
file: scenario_trace_anim
Commands in this Section:

**format**

format: replace <index> <format_string>

See Also:

User Manual - Section 8.2, Annot Mode
How To Create Color Legends
format: replace index

Command:

    format: replace <index> <format_string>

Purpose:

Replaces a default legend format string with the specified string.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>index</td>
<td>which format choice to replace</td>
</tr>
<tr>
<td>string</td>
<td>format_string</td>
<td>printf() style format to use</td>
</tr>
</tbody>
</table>

Notes:

Instead of using the default legend formats, custom ones can be specified to appear in the legend format dialog.

Example Usage:

```python
# I'd rather see printf() style %.3f formatting as the first choice in the legend format dialog format:
# replace 1 %.3f
```

See Also:

Associated format commands
Frames in this section:

frame

frame: #of_labels_x <num>
frame: #of_labels_y <num>
frame: #of_labels_z <num>
frame: assign <num>
frame: create
frame: delete
frame: len_x <len>
frame: len_y <len>
frame: len_z <len>
frame: line_width <width>
frame: modify_begin
frame: modify_end
frame: orientation_x <x_comp> <y_comp> <z_comp>
frame: orientation_y <x_comp> <y_comp> <z_comp>
frame: orientation_z <x_comp> <y_comp> <z_comp>
frame: origin <x_coord> <y_coord> <z_coord>
frame: rgb <red_val> <grn_val> <blu_val>
frame: select_all
frame: select_begin
frame: select_end
frame: select_default
frame: symmetry_angle <angle>
frame: symmetryAxis <axis>
frame: symmetry_delta <del_x> <del_y> <del_z>
frame: symmetry_file <filename>
frame: symmetry_mirror_x <toggle>
frame: symmetry_mirror_y <toggle>
frame: symmetry_mirror_z <toggle>
frame: symmetry_mirror_xy <toggle>
frame: symmetry_mirror_yz <toggle>
frame: symmetry_mirror_xz <toggle>
frame: symmetry_mirror_xyz <toggle>
frame: symmetry_rinstances <num>
frame: symmetry_tinstances <num>
frame: symmetry_type <options>
frame: symmetry_use_file <toggle>
frame: type <coord_system>
frame: visible <toggle>
frame: x_labels <toggle>
frame: y_labels <toggle>
frame: z_labels <toggle>

See Also:

User Manual - Section 8.5, Frame Mode
How To Create and Manipulate Frames
frame: _of_labels_x/y/z

Command:

frame: _of_labels_x <num>
frame: _of_labels_y <num>
frame: _of_labels_z <num>

Purpose:

Sets the number of labels that will be displayed along the frame x, y, z axes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of labels</td>
</tr>
</tbody>
</table>

Example Usage:

frame: select_begin
1
frame: select_end
frame: x_labels ON
frame: y_labels ON
frame: z_labels ON
frame: _of_labels_x 3
frame: _of_labels_y 4
frame: _of_labels_z 3

See Also:

Associated frame commands
Command:

    frame: assign <num>

Purpose:

Assigns selected parts to the specified frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>frame to assign the selected parts to</td>
</tr>
</tbody>
</table>

Notes:

Before this command is issued, you need to have one (and one only) frame selected, as well as the parts you will be assigning to the frame.

Example Usage:

    frame: create
    frame: select_begin
    1
    frame: select_end
    part: select_begin
    2
    part: select_end
    frame: assign 1

See Also:

Associated frame commands
frame: create

Command:
   frame: create

Purpose:
   Creates a new frame.

Parameters:
   none

Notes:
   The new frame will be created with the current default attributes.

Example Usage:
   frame: create

See Also:
   Associated frame commands
Command:

frame: delete

Purpose:

Deletes selected frames.

Parameters:

none.

Notes:

Before this command is issued, you need to select the frames you want deleted.

Example Usage:

frame: select_begin
  1  2
frame: select_end
frame: delete

See Also:

Associated frame commands
Command:

frame: len_x <len>
frame: len_y <len>
frame: len_z <len>

Purpose:

Sets the display length of the frame x, y, z axes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>len</td>
<td>length of the displayed frame axis (in model coordinates)</td>
</tr>
</tbody>
</table>

Example Usage:

frame: select_begin
1
frame: select_end
frame: len_x 8.0000e-01
frame: len_y 8.3333e-01
frame: len_z 8.3333e-01

See Also:

Associated frame commands
Command:

   frame: line_width <width>

Purpose:

Sets the line width of the displayed frame axes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>number of pixels wide</td>
</tr>
</tbody>
</table>

Example Usage:

   frame: select_begin
   1
   frame: select_end
   frame: line_width 3

See Also:

Associated frame commands
frame: modify_begin/end

Command:

```plaintext
frame: modify_begin
  <frame_command>
  <frame_command>
  ...
  <frame_command>
frame: modify_end
```

Purpose:

Grouping several frame attributes together that all need to be set before application.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>command</td>
<td>frame_command</td>
<td>any of the attribute changing frame: commands</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between frame: modify_begin and frame: modify_end commands.

Example Usage:

```plaintext
frame: select_begin
  1
frame: select_end
frame: modify_begin
frame: symmetry_type translational
frame: symmetry_use_file OFF
frame: symmetry_tinstances 2
frame: symmetry_delta 1.0000e+00 0.0000e+00 0.0000e+00
frame: modify_end
```

See Also:

Associated frame commands
Command:

frame: orientation_x <x_comp> <y_comp> <z_comp>
frame: orientation_y <x_comp> <y_comp> <z_comp>
frame: orientation_z <x_comp> <y_comp> <z_comp>

Purpose:
Sets the orientation of the x, y, z axes of the frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z components of vector representing the frame axis.</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Frame 0 is the model coordinate system. It is always cartesian and it cannot be modified. Other frames are always defined in terms of this cartesian coordinate system using the "frame: origin" command and this command (and it's two other sister commands).

Example Usage:

frame: select_begin
1
frame: select_end
frame: origin 1.0000e+00 1.0000e+00 5.0000e-01
frame: orientation_x 1.0000e+00 0.0000e+00 0.0000e+00
frame: orientation_y 0.0000e+00 1.0000e+00 0.0000e+00
frame: orientation_z 0.0000e+00 0.0000e+00 1.0000e+00

See Also:
Associated frame commands
**frame: origin**

**Command:**

```
frame: origin <x_coord> <y_coord> <z_coord>
```

**Purpose:**

Sets the location of the origin of a frame in model coordinates.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>model x, y, z coordinates of the origin of the frame</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Frame 0 is the model coordinate system. It is always cartesian and cannot be moved. Other frames are always defined in terms of this cartesian coordinate system using this command and the "frame: orientation" commands.

**Example Usage:**

```
frame: select_begin
1
frame: select_end
frame: origin 1.0000e+00 1.0000e+00 5.0000e-01
frame: orientation_x 1.0000e+00 0.0000e+00 0.0000e+00
frame: orientation_y 0.0000e+00 1.0000e+00 0.0000e+00
frame: orientation_z 0.0000e+00 0.0000e+00 1.0000e+00
```

**See Also:**

Associated `frame` commands
Command:

```
frame: rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Sets the color of the axes and labels of the selected frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, and blue components between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
frame: select_begin
1
frame: select_end
frame: rgb 1.0000e+00 0.0000e+00 3.9608e-01
```

See Also:

Associated frame commands
frame: select_all

Command:

    frame: select_all

Purpose:

    Selection of all visible frames.

Parameters:

    none.

Notes:

    Can be used to select all visible frames that subsequent frame commands will apply to.

Example Usage:

    frame: select_all

See Also:

    Associated frame commands
Command:

```
frame: select_begin
<frame1 frame2 ... frameN>
frame: select_end
```

Purpose:
Selection of frames.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>frameN</td>
<td>frame numbers</td>
</tr>
</tbody>
</table>

Notes:
These commands are needed to select frames before modifying any attributes, doing assignments, etc.

Example Usage:

```
frame: select_begin
  1 2
frame: select_end
frame: delete
```

See Also:
Associated frame commands
frame: select_default

Command:

    frame: select_default

Purpose:

Deselects all frames, such that subsequent frame attribute commands will modify default frame attributes.

Parameters:

    none.

Notes:

    When a new frame is created, it uses default attributes. This command allows you to change the defaults.

Example Usage:

    frame: select_default

See Also:

    Associated frame commands
Command:

```
frame: symmetry_angle <angle>
```

Purpose:

Sets the angle between instances for rotational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>angle</td>
<td>angle, in degrees, between instances</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between `frame: modify_begin` and `frame: modify_end` commands.

Example Usage:

```
frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_angle 3.5000e+01
frame: symmetry_rinstances 2
frame: symmetry_use_file OFF
frame: modify_end
```

See Also:

Associated `frame` commands
frame: symmetry_axis

Command:

```enlightenment
frame: symmetry_axis <axis>
```

Purpose:
Sets the major axis to use for rotational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>axis</td>
<td>major axis: x, y, or z</td>
</tr>
</tbody>
</table>

Notes:
Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between `frame: modify_begin` and `frame: modify_end` commands.

Example Usage:

```enlightenment
frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_angle 3.5000e+01
frame: symmetry_rinstances 2
frame: symmetry_use_file OFF
frame: symmetry_axis y
frame: modify_end
```

See Also:

Associated `frame` commands
Command:

```
frame: symmetry_delta <del_x> <del_y> <del_z>
```

Purpose:

Sets the delta values in the xyz directions between instances for translational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>del_x</td>
<td>x, y, z delta values (in model coordinates) between instances</td>
</tr>
<tr>
<td></td>
<td>del_y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>del_z</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between `frame: modify_begin` and `frame: modify_end` commands.

Example Usage:

```
frame: select_begin
  1
frame: select_end
frame: modify_begin
frame: symmetry_type translational
frame: symmetry_use_file OFF
frame: symmetry_tinstances 2
frame: symmetry_delta 1.0000e+00 0.0000e+00 0.0000e+00
frame: modify_end
```

See Also:

Associated `frame` commands
Command:

frame: symmetry_file <filename>

Purpose:

Sets the name of the periodic matchfile for the computational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>filename of periodic symmetry match file - should be a full path name.</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between frame: modify_begin and frame: modify_end commands.

If no matchfile is used, the rotational angle and number of instances (for rotational symmetry) or the translational deltas and number of instances (for translational symmetry) must be set in the user interface. Also, node hashing will be done in an attempt to eliminate duplicate nodes at the boundaries of instances. If a matchfile is used, the matchfile must follow the prescribed format, which contains the angle or delta, and the list of paired nodes that match at the instance boundaries. The number of instances still comes from the user interface.

Example Usage:

```plaintext
frame: select_begin
  1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_rinstances 5
frame: symmetry_use_file ON
frame: symmetry_file /usr/tmp/model.trn_match
frame: modify_end
```

See Also:

Associated frame commands
Command:

frame: symmetry_mirror_x <toggle>
frame: symmetry_mirror_y <toggle>
frame: symmetry_mirror_z <toggle>
frame: symmetry_mirror_xy <toggle>
frame: symmetry_mirror_yz <toggle>
frame: symmetry_mirror_xz <toggle>
frame: symmetry_mirror_xyz <toggle>

Purpose:

Sets the flag for mirror symmetry in the x / y / z / xy / yz / xz / xyz directions.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to mirror</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF otherwise</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between frame: modify_begin and frame: modify_end commands.

Example Usage:

frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type mirror
frame: symmetry_mirror_x ON
frame: symmetry_mirror_z ON
frame: symmetry_mirror_y ON
frame: symmetry_mirror_xy OFF
frame: symmetry_mirror_yz OFF
frame: symmetry_mirror_xz OFF
frame: symmetry_mirror_xyz OFF
frame: modify_end

See Also:

Associated frame commands
frame: symmetry_rinstances

Command:

frame: symmetry_rinstances <num>

Purpose:

Sets the number of instances for rotational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of instances</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between frame: modify_begin and frame: modify_end commands.

Example Usage:

frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_angle 3.5000e+01
frame: symmetry_rinstances 5
frame: symmetry_use_file OFF
frame: modify_end

See Also:

Associated frame commands
frame: symmetry_tinstances

Command:

```
frame: symmetry_tinstances <num>
```

Purpose:

Sets the number of instances for translational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of instances</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between `frame: modify_begin` and `frame: modify_end` commands.

Example Usage:

```
frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type translational
frame: symmetry_use_file OFF
frame: symmetry_tinstances 2
frame: symmetry_delta 1.0000e+00 0.0000e+00 0.0000e+00
frame: modify_end
```

See Also:

Associated `frame` commands
frame: symmetry_type

Command:

frame: symmetry_type <options>

Purpose:

Sets the type of periodic symmetry to apply to parts attached to the frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>options</td>
<td>mirror: instances will reflect into appropriate quadrants</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rotational: instances will repeat at specified angles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>translational: instances will repeat in a given direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>non: single instance only (default)</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between frame: modify_begin and frame: modify_end commands.

Example Usage:

frame: select_begin
1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_angle 3.5000e+01
frame: symmetry_rinstances 2
frame: symmetry_use_file OFF
frame: modify_end

See Also:

Associated frame commands
Command:

```
frame: symmetry_use_file <toggle>
```

Purpose:

Sets whether a periodic matchfile will be used for specification of the rotational or translational symmetry.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON               if matchfile is to be used</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF               otherwise</td>
</tr>
</tbody>
</table>

Notes:

Since modification of frame symmetry attributes typically need more than one attribute change before being able to properly perform the option, one typically should encase the attribute lines between `frame: modify_begin` and `frame: modify_end` commands.

If no matchfile is used, the rotational angle and number of instances (for rotational symmetry) or the translational deltas and number of instances (for translational symmetry) must be set in the user interface. Also, node hashing will be done in an attempt to eliminate duplicate nodes at the boundaries of instances. If a matchfile is used, the matchfile must follow the prescribed format, which contains the angle or delta, and the list of paired nodes that match at the instance boundaries. The number of instances still comes from the user interface.

Example Usage:

```
frame: select_begin
  1
frame: select_end
frame: modify_begin
frame: symmetry_type rotational
frame: symmetry_rinstances 5
frame: symmetry_use_file ON
frame: symmetry_file /usr/tmp/model.trn_match
frame: modify_end
```

See Also:

Associated `frame` commands
frame: type

Command:

    frame: type <coord_system>

Purpose:

Set the coordinate system type for the frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>coord_system</td>
<td>rectangular   for cartesian coordinate system (xyz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cylindrical for cylindrical coordinate system (rtz)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>spherical for spherical coordinate system (rpt)</td>
</tr>
</tbody>
</table>

Example Usage:

    frame: select_begin
    1
    frame: select_end
    frame: type cylindrical

See Also:

Associated frame commands
Command:

```plaintext
frame: visible <toggle>
```

Purpose:

Set the frame axis visibility on or off

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
frame: select_begin
1
frame: select_end
frame: visible ON
```

See Also:

Associated `frame` commands
frame: x/y/z_labels

Command:

frame: x_labels <toggle>
frame: y_labels <toggle>
frame: z_labels <toggle>

Purpose:

Sets the visibility of labels along the frame x/y/z axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON for labels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for no labels</td>
</tr>
</tbody>
</table>

Example Usage:

frame: select_begin
1
frame: select_end
frame: x_labels ON
frame: y_labels ON
frame: z_labels ON
frame: #_of_labels_x 3
frame: #_of_labels_y 4
frame: #_of_labels_z 3

See Also:

Associated frame commands
Commands in this Section:

function

function: #_of_colors <num>
function: #_of_levels <num>
function: display_undefined <option>
function: edit_level <num>
function: limit_fringes <option>
function: modify_begin
function: modify_end
function: over_time <toggle> [<beg_step> <end_step>]
function: palette <palette_name>
function: restore <palette_filename>
function: restore_predefinedpal <level_option> <palette_name>
function: RGB <red_val> <grn_val> <blu_val>
function: save <palette_filename>
function: save_all <palette_filename>
function: save_current_case <palette_filename>
function: scale <scale_type>
function: select_default
function: type <type>
function: value <var_value>

See Also:

User Manual - Section 4.2, Variable Summary & Palette
How To Edit Color Palettes
function: #_of_colors

Command:

    function: #_of_colors <num>

Purpose:

    Sets the number of colors per level in a texture palette.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of colors per level in the texture palette</td>
</tr>
</tbody>
</table>

Notes:

    This command is only useful when doing texture palettes.

Example Usage:

    function: palette temperature
    function: #_of_colors 4

See Also:

    Associated function commands
Command:

```
function: #_of_levels <num>
```

Purpose:

Sets the number of levels in the palette.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of levels in the palette</td>
</tr>
</tbody>
</table>

Notes:

Each level has a value and a color associated with it. Interpolations occur between the levels according to the type and scale used.

Example Usage:

```
function: palette N_temperature
function: modify_begin
function: #_of_levels 6
function: edit_level 2
function: value 9.6464e+00
function: edit_level 3
function: value 1.9283e+01
function: edit_level 4
function: value 2.8919e+01
function: edit_level 5
function: value 3.8556e+01
function: edit_level 6
function: value 4.8192e+01
function: edit_level 1
function: RGB 5.0000e-01 0.0000e+00 1.0000e+00
function: edit_level 2
function: RGB 0.0000e+00 0.0000e+00 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 4
function: RGB 0.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 6
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
```

See Also:

Associated function commands
**function: display_undefined**

**Command:**

```
function: display_undefined <option>
```

**Purpose:**

Selects how elements/nodes, at which variables are undefined, will be displayed.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>One of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by_part_color: elements/nodes with undefined variables are colored by the part color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by_invisible: elements/nodes with undefined variables are not displayed</td>
</tr>
</tbody>
</table>

**See Also:**

Associated function commands
Command:

```
function: edit_level <num>
```

Purpose:

Sets the level in the palette for which value or color will be set/modified.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>level number (1 based, with 1 being the lowest level)</td>
</tr>
</tbody>
</table>

Notes:

Each level has a value and a color associated with it. Interpolations occur between the levels according to the type and scale used.

Example Usage:

```
function: palette N_temperature
function: modify_begin
function: #_of_levels 6
function: edit_level 2
function: value 9.6464e+00
function: edit_level 3
function: value 1.9283e+01
function: edit_level 4
function: value 2.8919e+01
function: edit_level 5
function: value 3.8556e+01
function: edit_level 6
function: value 4.8192e+01
function: edit_level 1
function: RGB 5.0000e-01 0.0000e+00 1.0000e+00
function: edit_level 2
function: RGB 0.0000e+00 0.0000e+00 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 4
function: RGB 0.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 6
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
```

See Also:

Associated function commands
function: limit_fringes

Command:

```plaintext
function: limit_fringes <option>
```

Purpose:

Selects how shaded elements above or below the min and max palette levels will be displayed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>One of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No</td>
</tr>
<tr>
<td></td>
<td></td>
<td>elements/nodes below the min level are colored by min level and elements/nodes above the max level are colored by the max level.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by_part_color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>elements/nodes below the min and above the max are colored by the part color</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by_invisible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>elements/nodes below the min and above the max are not displayed</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
function: palette N_temperature
function: modify_begin
function: type continuous
function: limit_fringes by_invisible
function: modify_end
```

See Also:

Associated function commands
Command:

\[
\text{function: modify_begin} \\
<\text{function\_command1}> \\
<\text{function\_command2}> \\
. \\
. \\
<\text{function\_commandN}> \\
\text{function: modify\_end}
\]

Purpose:

Groups function attribute commands together before applying them.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>function_commandN</td>
<td>any of the function commands which modify attributes</td>
</tr>
</tbody>
</table>

Example Usage:

\[
\text{function: palette Stress} \\
\text{function: modify\_begin} \\
\text{function: edit\_level 1} \\
\text{function: RGB 1.0000e+00 0.0000e+00 0.0000e+00} \\
\text{function: edit\_level 2} \\
\text{function: RGB 1.0000e+00 1.0000e+00 0.0000e+00} \\
\text{function: edit\_level 3} \\
\text{function: RGB 0.0000e+00 1.0000e+00 0.0000e+00} \\
\text{function: edit\_level 4} \\
\text{function: RGB 0.0000e+00 1.0000e+00 1.0000e+00} \\
\text{function: edit\_level 5} \\
\text{function: RGB 0.0000e+00 0.0000e+00 1.0000e+00} \\
\text{function: edit\_level 6} \\
\text{function: RGB 5.0000e-01 0.0000e+00 1.0000e+00} \\
\text{function: modify\_end}
\]

See Also:

Associated function commands
function: over_time

Command:

```
function: over_time <toggle> [<beg_step> <end_step>]
```

Purpose:

Sets the option to include variable ranges over a time range on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to include variable ranges over time. For this option, the beg_step and end_step must be included</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF variable ranges at current time only</td>
</tr>
<tr>
<td>int</td>
<td>beg_step</td>
<td>The beginning time step to consider for the time range. Only needed if toggle is ON</td>
</tr>
<tr>
<td>int</td>
<td>end_step</td>
<td>The ending time step to consider for the time range. Only needed if toggle is ON</td>
</tr>
</tbody>
</table>

Notes:

The minimum and maximum values of a variable's range, and thus the resulting palette levels will be based on the current time when a variable is activated, unless this command has been used.

Example Usage:

```
function: palette Stress
function: over_time ON 0 16
function: Displacement
function: over_time OFF
```

See Also:

Associated function commands
function: palette

Command:

    function: palette <palette_name>

Purpose:

Selects the palette that will be modified.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_name</td>
<td>name of the palette (It will be the same as the variable, or variable component that it represents).</td>
</tr>
</tbody>
</table>

Notes:

Only one palette at a time can be modified.

Example Usage:

    function: palette N_temperature
    function: modify_begin
    function: #_of_levels 4
    function: edit_level 2
    function: value 1.6064e+01
    function: edit_level 3
    function: value 3.2128e+01
    function: edit_level 4
    function: value 4.8192e+01
    function: edit_level 2
    function: RGB 0.0000e+00 1.0000e+00 6.6667e-01
    function: edit_level 3
    function: RGB 6.6667e-01 1.0000e+00 0.0000e+00
    function: edit_level 4
    function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
    function: modify_end

See Also:

Associated function commands
function: restore

**Command:**

```
function: restore <palette_filename>
```

**Purpose:**

Restore a previously saved palette from a file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_filename</td>
<td>name of the file containing a palette definition</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
function: restore /usr/tmp/mystress.pal
function: palette Stress
```

**See Also:**

Associated function commands
**Command:**

```
function: restore_predefinedpal <level_option> <palette_name>
```

**Purpose:**

Restores predefined palettes that are in the user's default palette directory.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>level_option</td>
<td>One of the following:</td>
</tr>
<tr>
<td></td>
<td>use_new_levels</td>
<td>changes the number of levels to match that of the predefined palette.</td>
</tr>
<tr>
<td></td>
<td>use_existing_levels</td>
<td>keeps the number of current levels and interpolates the predefined palette values and colors to this number of levels</td>
</tr>
<tr>
<td>string</td>
<td>palette_name</td>
<td>name of the predefined palette to restore</td>
</tr>
</tbody>
</table>

**Notes:**

Predefined palettes reside in a user's .ensight7/palettes directory.

**Example Usage:**

```
function: restore_predefinedpal use_new_levels mypal
```

**See Also:**

Associated function commands
**function: RGB**

**Command:**

```
function: RGB <red_val> <grn_val> <blu_val>
```

**Purpose:**

Sets the color to associate with a level in the palette.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue components of color (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Each level has a value and a color associated with it. Interpolations occur between the levels according to the type and scale used.

**Example Usage:**

```
function: palette N_temperature
function: modify_begin
function: #_of_levels 6
function: edit_level 2
function: value 9.6464e+00
function: edit_level 3
function: value 1.9283e+01
function: edit_level 4
function: value 2.8919e+01
function: edit_level 5
function: value 3.8556e+01
function: edit_level 6
function: value 4.8192e+01
function: edit_level 1
function: RGB 5.0000e-01 0.0000e+00 1.0000e+00
function: edit_level 2
function: RGB 0.0000e+00 0.0000e+00 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 4
function: RGB 0.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 6
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
```

**See Also:**

Associated function commands
function: save

Command:

    function: save <palette_filename>

Purpose:

    Save the current palette to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_filename</td>
<td>name of the file containing a palette definition</td>
</tr>
</tbody>
</table>

Notes:

    A saved palette can later be restored.

Example Usage:

    function: palette Stress
    function: save /usr/tmp/mystress.pal

See Also:

    Associated function commands
function: save_all

Command:

    function: save_all <palette_filename>

Purpose:

Save all palettes to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_filename</td>
<td>name of the file containing palette definitions</td>
</tr>
</tbody>
</table>

Notes:

Palettes saved in a file can later be restored.

Example Usage:

    function: save_all /usr/tmp/allmy.pal

See Also:

Associated function commands
function: save_current_case

Command:

    function: save_current_case <palette_filename>

Purpose:

Save palettes, of active variables of the currently selected case, to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_filename</td>
<td>name of the file containing palette definitions</td>
</tr>
</tbody>
</table>

Notes:

Palettes saved in a file can later be restored.

Note that this command is not generated by EnSight, but can be placed in a command file manually if desired.

Example Usage:

    function: save_current_case /usr/tmp/allmy.pal

See Also:

Associated function commands
function: scale

Command:

function: scale <scale_type>

Purpose:

Sets the type of scale for value-separation of levels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>scale_type</td>
<td>Can be one of the following types:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>linear value-separation or levels is uniform and values map linearly to the colors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>quadratic value-separation of levels is not uniform, but are based on the second order of the variable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logarithmic value-separation of levels in not uniform, but are based on the base-10 logarithm of the variable</td>
</tr>
</tbody>
</table>

Example Usage:

function: palette N_temperature
function: type continuous
function: modify_begin
function: scale quadratic
function: edit_level 2
function: value 1.9373e+00
function: edit_level 3
function: value 7.7191e+00
function: edit_level 4
function: value 1.7356e+01
function: edit_level 5
function: value 3.0846e+01
function: edit_level 6
function: value 4.8192e+01
function: modify_end

See Also:

Associated function commands
Command:

    function: select_default

Purpose:

    Set palette selection to none, so that subsequent function attribute commands will apply to the
default.

Parameters:

    none

Example Usage:

    function: select_default
    function: #_of_levels 4
    function: modify_begin
    function: edit_level 1
    function: value 1.0000e-02
    function: edit_level 2
    function: value 1.6071e+01
    function: edit_level 3
    function: value 3.2131e+01
    function: edit_level 4
    function: value 4.8192e+01
    function: modify_end

See Also:

    Associated function commands
function: type

Command:

function: type <type>

Purpose:

Sets the type of color gradation that will be applied across elements.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>Can be one of the following types:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>continuous: legend will be smoothly varied, and an element's color will vary across the element as needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>banded: legend will show lines or demarcation, as will elements as needed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>constant: legend will appear as continuous, but elements will be colored a constant color over the entire element</td>
</tr>
</tbody>
</table>

Example Usage:

function: palette N_temperature
function: type banded

See Also:

Associated function commands
Command:

```
function: value <var_value>
```

Purpose:

Sets the value to associate with a level in the palette.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>var_value</td>
<td>variable value to assign to the level</td>
</tr>
</tbody>
</table>

Notes:

Each level has a value and a color associated with it. Interpolations occur between the levels according to the type and scale used.

Example Usage:

```
function: palette N_temperature
function: modify_begin
function: #_of_levels 6
function: edit_level 2
function: value 9.6464e+00
function: edit_level 3
function: value 1.9283e+01
function: edit_level 4
function: value 2.8919e+01
function: edit_level 5
function: value 3.8556e+01
function: edit_level 6
function: value 4.8192e+01
function: edit_level 1
function: RGB 5.0000e-01 0.0000e+00 1.0000e+00
function: edit_level 2
function: RGB 0.0000e+00 0.0000e+00 1.0000e+00
function: edit_level 3
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 4
function: RGB 0.0000e+00 1.0000e+00 1.0000e+00
function: edit_level 5
function: RGB 1.0000e+00 1.0000e+00 0.0000e+00
function: edit_level 6
function: RGB 1.0000e+00 0.0000e+00 0.0000e+00
function: modify_end
```

See Also:

Associated function commands
Commands in this Section:

isos

isos: begin
isos: end
isos: component <x_scale> <y_scale> <z_scale>
isos: constraint <isovolume_bound>
isos: create
isos: interactive_auto_delta <delta>
isos: interactive_rangemin <min_range>
isos: interactive_rangemax <max_range>
isos: interactive_type <type>
isos: min <min_value>
isos: max <max_value>
isos: select_default
isos: type <iso_type>
isos: value <iso_value>
isos: variable <var_name>

See Also:

User Manual - Section 7.3, Isosurface Create/Update
How To Create Isosurfaces
**Command:**

```
isos: begin
isos: end
```

**Purpose:**

Delimit the modifications for iso-surface attributes

**Parameters:**

none

**Notes:**

These commands are used to set the attributes for a isosurface part creation.

**Example Usage:**

```
isos: begin
isos: variable temperature
isos: value 1.1
isos: type isosurface
isos: end
isos: create
```

**See Also:**

Associated `isos` commands
Command:

isos: component <x_scale> <y_scale> <z_scale>

Purpose:

The isosurface algorithm works only on scalar variables. For a vector, this command specifies how a scalar will be created from the vector.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scale</td>
<td>factor to scale the x, y, z components of the vector</td>
</tr>
<tr>
<td></td>
<td>y_scale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_scale</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The scale factors apply only if the isosurface variable is a vector.

Usually used with a scale factor of 0 or 1. in order to use only a component of a vector.

A special condition exists when \( x_scale = y_scale = z_scale = 0 \), in which case the vector magnitude is used.

The default is \( x_scale = y_scale = z_scale = 0 \).

Example Usage:

```plaintext
part: select_begin
  3
part: select_end
#
# Use the y_component of the vector
#
part: modify_begin
isos: component 0 1 0
part: modify_end
```

See Also:

Associated isos commands
**Command:**

`isos: constraint <isovolume_bound>`

**Purpose:**

Set the bounding condition for an isovolume.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>isovolume_bound</td>
<td>low: isovolume will contain geometry with variable values &lt;= to the value specified with &quot;isos: min&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>high: isovolume will contain geometry with variable values &gt;= to the value specified with &quot;isos: max&quot;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>band: isovolume will contain geometry with variable values &gt;= the value specified with &quot;isos: min&quot; and &lt;= the value specified with &quot;isos: max&quot;</td>
</tr>
</tbody>
</table>

**Notes:**

Is used only when "isos: type" is set to isovolume.

**Example Usage:**

```
isos: begin
isos: variable temperature
isos: type isovolume
isos: constraint band
isos: min 1.
isos: max 2.
isos: end
isos: create
```

**See Also:**

Associated `isos` commands
Command:

isos: create

Purpose:
Create a isosurface part with the currently defined attributes using the currently selected parts as parent parts.

Parameters:

none

Notes:
The isosurface part is created using the currently selected parts as parents.
The isosurface part is created using the currently set isosurface attributes.

Example Usage:

isos: begin
isos: variable temperature
isos: type isovolume
isos: constraint band
isos: min 1.
isos: max 2.
isos: end
isos: create

See Also:

Associated isos commands
**isos: interactive_auto_delta**

**Command:**

`isos: interactive_auto_delta <delta>`

**Purpose:**

Set the isosurface animation delta for use when surface is set to interactive mode via "isos: interactive_type auto/auto_cycle".

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>delta</td>
<td>delta value that will be added to the isosurface value for each refresh of the screen</td>
</tr>
</tbody>
</table>

**Notes:**

The currently selected part must be an isosurface part. Not used for isovolume parts.

**Example Usage:**

```
part: select_begin
3
part: select_end
isos: interactive_type auto
isos: interactive_rangemin 0.
isos: interactive_rangemax 5.
isos: interactive_auto_delta .5
```

**See Also:**

Associated `isos` commands
**Command:**

```
isos: interactive_rangemin <min_range>
isos: interactive_rangemax <max_range>
```

**Purpose:**

Set the minimum/maximum isosurface value when isosurface is in an interactive mode.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min_range</td>
<td>minimum isosurface value when displaying interactive</td>
</tr>
<tr>
<td></td>
<td>max_range</td>
<td>maximum isosurface value when displaying interactive</td>
</tr>
</tbody>
</table>

**Notes:**

The currently selected part must be an isosurface part. Not used for isovolume parts.

**Example Usage:**

```
part: select_begin 3
part: select_end
isos: interactive_type auto
isos: interactive_rangemin 0.
isos: interactive_rangemax 5.
isos: interactive_auto_delta .5
```

**See Also:**

Associated `isos` commands
**Command:**

`isos: interactive_type <type>`

**Purpose:**

Specify the interactive setting for an isosurface.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>off</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the isosurface is not in interactive mode</td>
</tr>
<tr>
<td>manual</td>
<td></td>
<td>set the interactive state to manual such that the</td>
</tr>
<tr>
<td></td>
<td></td>
<td>isosurface value can be updated via the user</td>
</tr>
<tr>
<td></td>
<td></td>
<td>interface slider</td>
</tr>
<tr>
<td>auto</td>
<td></td>
<td>set the interactive state to auto such that the iso</td>
</tr>
<tr>
<td></td>
<td></td>
<td>value is incremented by the <code>interactive_auto_delta</code></td>
</tr>
<tr>
<td></td>
<td></td>
<td>value</td>
</tr>
<tr>
<td>auto_cycle</td>
<td></td>
<td>same as &quot;auto&quot; except that when the max is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>reached the <code>interactive_auto_delta</code> value is</td>
</tr>
<tr>
<td></td>
<td></td>
<td>decremented back to the min value.</td>
</tr>
</tbody>
</table>

**Notes:**

The min and max values are constrained via the `interactive_rangemin/max` commands. Only isosurfaces can be in interactive mode (i.e., isovolumes can not).

**Example Usage:**

```
part: select_begin
3
part: select_end
isos: interactive_type auto
isos: interactive_rangemin 0.
isos: interactive_rangemax 5.
isos: interactive_auto_delta .5
```

**See Also:**

Associated `isos` commands
**Command:**

```plaintext
isos: min <min_value>
isos: max <max_value>
```

**Purpose:**

Set the min/max constraint values for an isovolume.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min_value</td>
<td>minimum iso constraint</td>
</tr>
<tr>
<td></td>
<td>max_value</td>
<td>maximum iso constraint</td>
</tr>
</tbody>
</table>

**Notes:**

Is used only when "isos: type" is set to isovolume.

**Example Usage:**

```plaintext
isos: begin
isos: variable temperature
isos: type isovolume
isos: constraint band
isos: min 1.
isos: max 2.
isos: end
isos: create
```

**See Also:**

Associated `isos` commands
**Command:**

```
isos: select_default
```

**Purpose:**

Sets the target to the default settings for subsequent attribute modifications.

**Parameters:**

none

**Example Usage:**

```
isos: select_default
part: modify_begin
isos: variable temperature
isos: value 1.0
part: modify_end
```

**See Also:**

Associated **isos** commands
Command:

`isos: type <iso_type>`

Purpose:

Set the isosurface part to represent a surface or a volume.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>iso_type</td>
<td>isosurface</td>
<td>for a surface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>isovolume</td>
<td>for a volume</td>
</tr>
</tbody>
</table>

Notes:

The default is `isosurface`.

Example Usage:

```
isos: begin
isos: variable temperature
isos: value 1.1
isos: type isovolume
isos: constraint band
isos: min 1.
isos: max 2.
isos: end
isos: create
```

See Also:

Associated `isos` commands
**Command:**

```
isos: value <iso_value>
```

**Purpose:**

Specify the isosurface value.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>iso_value</td>
<td>iso value</td>
</tr>
</tbody>
</table>

For a scalar variable, the value is the scalar value at which the isosurface (or line) will be generated.

For a vector variable, the value represents the magnitude or a scaling of vector components (see Notes below).

**Notes:**

Is not used for isovolumes.

For a vector: If the following is defined:

- \( X_{\text{var}} \) = The vector X component
- \( Y_{\text{var}} \) = The vector Y component
- \( Z_{\text{var}} \) = The vector Z component

- \( X_{\text{com}} \) = The X vector scale factor as specified with "isos: component"
- \( Y_{\text{com}} \) = The Y vector scale factor as specified with "isos: component"
- \( Z_{\text{com}} \) = The Z vector scale factor as specified with "isos: component"

then the isosurface (or line) created represents a uniform scalar value where

\[
X_{\text{var}}*X_{\text{com}} + Y_{\text{var}}*Y_{\text{com}} + Z_{\text{var}}*Z_{\text{com}} = iso\_value,
\]

except in the special case where \( X_{\text{com}} = Y_{\text{com}} = Z_{\text{com}} = 0 \), in which case the isosurface (or line) created represents a uniform scalar value where

\[
\sqrt{X_{\text{var}}*X_{\text{var}} + Y_{\text{var}}*Y_{\text{var}} + Z_{\text{var}}*Z_{\text{var}}} = iso\_value.
\]

**Example Usage:**

```
isos: begin
isos: variable temperature
isos: value 1.1
isos: type isosurface
isos: end
isos: create
```

**See Also:**

Associated `isos` commands
**Command:**

```
isos: variable <var_name>
```

**Purpose:**

Set the isosurface variable.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var_name</td>
<td>name of an active variable</td>
</tr>
</tbody>
</table>

**Notes:**

A variable must be active before it can be used for isosurfaces.

**Example Usage:**

```
isos: begin
isos: variable temperature
isos: value 1.1
isos: type isosurface
isos: end
isos: create
```

**See Also:**

Associated `isos` commands
isos: variable
Commands in this Section:

**legend**

- legend: format `<number_format>`
- legend: height `<num>`
- legend: location_x `<num>`
- legend: location_y `<num>`
- legend: orientation `<layout>`
- legend: select_all
- legend: select_default
- legend: select_palette_begin
- legend: select_palette_end
- legend: text_position `<location>`
- legend: text_rgb `<red_val> <grn_val> <blu_val>`
- legend: text_size `<size>`
- legend: title `<location>`
- legend: type `<bar_type>`
- legend: visible `<toggle>`
- legend: width `<num>`

**See Also:**

- User Manual - Section 8.2, Annot Mode
- How To Create Color Legends
**legend: format**

**Command:**

`legend: format <number_format>`

**Purpose:**

Set the number format for legend labels.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>number_format</td>
<td>This can be any valid C language number format, such as:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%.2e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%12.5e</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%f</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%g</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%.4f</td>
</tr>
</tbody>
</table>

**Notes:**

If you are not familiar with the C language, any C language manual will have a description of valid number formats and how they affect the displayed appearance of a number.

**Example Usage:**

```plaintext
legend: select_palette_begin
pressure
legend: select_palette_end
legend: format %.2e
```

**See Also:**

Associated `legend` commands
Command:

`legend: height <num>`

Purpose:

Set the height of the legend bar

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>height of the legend bar</td>
</tr>
</tbody>
</table>

Notes:

The height is in terms of screen coordinates, which are 0.0 to 1.0 in both x and y directions.

Example Usage:

```
legend: select_palette_begin
pressure
legend: select_palette_end
legend: location_x 2.1362e-01
legend: location_y 4.5270e-02
legend: width 5.7778e-02
legend: height 8.5655e-01
```

See Also:

Associated `legend` commands
Command:

legend: location_x <num>
legend: location_y <num>

Purpose:

Set the horizontal/vertical location of the legend on the screen.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>horizontal/vertical screen position of lower left of legend bar</td>
</tr>
</tbody>
</table>

Notes:

The range of valid x/y screen position values is 0.0 to 1.0.

Example Usage:

legend: select_palette_begin
pressure
legend: select_palette_end
legend: location_x .2
legend: location_y .05

See Also:

Associated legend commands
Command:

```
legend: orientation <layout>
```

Purpose:
Set the legend bar to be either vertical or horizontal.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>layout</td>
<td>vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>horizontal</td>
</tr>
</tbody>
</table>

Notes:
The normal orientation is vertical. If orientation is set to horizontal, be aware that width is now in the y-direction, height in the x-direction, and that label sizes become more important to avoid overlaps (even though it will attempt to alleviate this by alternating sides if needed).

Example Usage:

```
legend: select_palette_begin
velocity
legend: select_palette_end
legend: visible ON
legend: orientation horizontal
legend: select_palette_begin
pressure
legend: select_palette_end
legend: orientation vertical
```

See Also:
Associated `legend` commands
legend: select_all

Command:

legend: select_all

Purpose:

Selects all legends that are currently visible, for which other attributes will be set or modified.

Parameters:

none

Notes:

If any legends are currently visible, but not currently selected, this command will cause them to become selected. Thus, subsequent attribute modifications will apply to all visible legends.

Example Usage:

legend: select_all
legend: type continuous
legend: title below

See Also:

Associated legend commands
Command:

```
legend: select_default
```

**Purpose:**

Sets the current legend selection to the default, so default attributes can be modified.

**Parameters:**

none

**Notes:**

Any legend attributes set or modified after this command (and before another `legend: select_palette_begin` and `legend: select_palette_end` pair) will be applied to the "default" legend. The default legend attributes will be applied for any subsequent legends which are made active (made visible for the first time).

**Example Usage:**

```
legend: select_default
legend: orientation horizontal
legend: title below
```

**See Also:**

Associated `legend` commands
Command:

```plaintext
legend: select_palette_begin
palette_name
palette_name
.
.
palette_name
legend: select_palette_end
```

Purpose:

Selection of legends, for which attributes will be set or modified.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>palette_name</td>
<td>palette name</td>
</tr>
</tbody>
</table>

Notes:

The legends bracketed by these two commands are the ones to which subsequent legend commands will be applied.

Example Usage:

```plaintext
legend: select_palette_begin
pressure
velocity
legend: select_palette_end
legend: visible ON
```

See Also:

Associated `legend` commands
Command:

```
legend: text_position <location>
```

Purpose:

Set the visibility and location of legend labels in relation to the legend color bar.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>location</td>
<td>left to have labels on the left of the bar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>right to have labels on the right of the bar</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none to have no labels</td>
</tr>
</tbody>
</table>

Example Usage:

```
legend: select_palette_begin
pressure
legend: select_palette_end
legend: text_position left
legend: select_palette_begin
velocity
legend: select_palette_end
legend: text_position right
legend: select_palette_begin
temperature
legend: select_palette_end
legend: text_position none
```

See Also:

Associated `legend` commands
Command:

    legend: text_rgb <red_val> <grn_val> <blu_val>

Purpose:

Sets the color of the legend text for title and labels.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue contributions of the color (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

    legend: select_palette_begin
    velocity
    legend: select_palette_end
    legend: text_size 35
    legend: format %.2f
    legend: text_rgb 1.0000e+00 0.0000e+00 3.9608e-01

See Also:

Associated legend commands
**Command:**

```
legend: text_size <size>
```

**Purpose:**

Sets the size of font to use for legend title and labels.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>size</td>
<td>font size to use</td>
</tr>
</tbody>
</table>

**Notes:**

This size is a relative size based on the graphics window. It will change appropriately as the graphics window changes.

**Example Usage:**

```
legend: select_palette_begin
velocity
legend: select_palette_end
legend: text_size 35
legend: format %.2f
legend: text_rgb 1.0000e+00 0.0000e+00 3.9608e-01
```

**See Also:**

Associated `legend` commands
legend: title

Command:

`legend: title <location>`

Purpose:

Set the visibility and location of a legend title in relation to the legend color bar.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>location</td>
<td>above</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to have the title at the top of the legend</td>
</tr>
<tr>
<td></td>
<td></td>
<td>below</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to have the title at the bottom of the legend</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to have no title</td>
</tr>
</tbody>
</table>

Example Usage:

```
legend: select_palette_begin
pressure
legend: select_palette_end
legend: type continuous
legend: title above
legend: select_palette_begin
velocity
legend: select_palette_end
legend: title below
legend: title none
```

See Also:

Associated `legend` commands
Command:

legend: type <bar_type>

Purpose:

Set the type of bar to use for color representation of legend values.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>bar_type</td>
<td>continuous to have a single continuous color bar.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>discrete to have a small color rectangle per palette level</td>
</tr>
</tbody>
</table>

Notes:

A continuous bar shows all the variations as one color changes to another, while a discrete bar shows the color at the levels only.

Example Usage:

legend: select_palette_begin
pressure
legend: select_palette_end
legend: type discrete
legend: select_palette_begin
velocity
legend: select_palette_end
legend: type continuous

See Also:

Associated legend commands
legend: visible

Command:

    legend: visible <toggle>

Purpose:

To turn the visibility of a legend on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

The command applies to the currently selected legend(s)

Example Usage:

    legend: select_palette_begin
    pressure
    legend: select_palette_end
    legend: visible ON
    legend: select_palette_begin
    velocity
    legend: select_palette_end
    legend: visible OFF

See Also:

Associated legend commands
Command:

```
legend: width <num>
```

Purpose:

Set the width of the legend bar.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>width of the legend bar</td>
</tr>
</tbody>
</table>

Notes:

The width is in terms of screen coordinates, which are 0.0 to 1.0 in both x and y directions.

Example Usage:

```
legend: select_palette_begin
pressure
legend: select_palette_end
legend: location_x 2.1362e-01
legend: location_y 4.5270e-02
legend: width 5.7778e-02
legend: height 8.5655e-01
```

See Also:

Associated `legend` commands
Commands in this Section:

line

- line: arrowhead <head_type>
- line: delete
- line: location_x <index> <coord>
- line: location_y <index> <coord>
- line: modify_begin
- line: modify_end
- line: new_line
- line: rgb <red_val> <grn_val> <blu_val>
- line: select_all
- line: select_begin
- line: select_end
- line: select_default
- line: visible <toggle>
- line: width <width>

See Also:

- User Manual - Section 8.2, Annot Mode
- How To Create Lines and Arrows
**Command:**

```
line: arrowhead <head_type>
```

**Purpose:**

Controls the display of arrowheads on the currently selected line in the graphics window.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>head_type</td>
<td>can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on_first_end</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on_second_end</td>
</tr>
<tr>
<td></td>
<td></td>
<td>on_both_ends</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
line: select_begin
1
line: select_end
line: arrowhead on_first_end
```

**See Also:**

Associated line commands
Command:

```
line: delete
```

Purpose:

Deletes the currently selected line in the graphics window.

Parameters:

none

Example Usage:

```
line: select_begin
1 2 3
line: select_end
line: delete
```

See Also:

Associated line commands
Command:

\texttt{line: location\_x <index> <coord>}
\texttt{line: location\_y <index> <coord>}

Purpose:

Specifies the x/y coordinate of an endpoint for the selected line in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>index</td>
<td>Must be either 1 or 2, depending on which endpoint is being specified.</td>
</tr>
<tr>
<td>float</td>
<td>coord</td>
<td>Specifies the x/y coordinate. A value of 0.0 indicates the left/bottom side of the window, while a value of 1.0 indicates the right/top side.</td>
</tr>
</tbody>
</table>

Example Usage:

\begin{verbatim}
line: select\_begin
  1
line: select\_end
line: location\_x 1 0.5
line: location\_y 1 0.6
line: location\_x 2 0.1
line: location\_y 2 0.3
\end{verbatim}

See Also:

Associated line commands
Command:

    line: modify_begin
    line: modify_end

Purpose:

These optional commands can be used to demarcate a series of line: commands which apply to
the same line or lines so that they can be executed at one time for better performance.

Parameters:

none

Example Usage:

    line: select_begin
    1
    line: select_end
    line: modify_begin
    line: rgb 1 0 0
    line location_x 1 100
    line location_y 1 20
    line location_x 2 10
    line location_y 2 10
    line modify_end

See Also:

Associated line commands
line: new_line

Command:

    line: new_line

Purpose:

    Creates a new line in the graphics window.

Parameters:

    none

Example Usage:

    line: new_line
    line: location_x 1 0.5
    line: location_y 1 0.6
    line: location_x 2 0.6
    line: location_y 2 0.5

See Also:

    Associated line commands
Command:

    line: rgb <red_val> <grn_val> <blu_val>

Purpose:

    Specifies the RGB color value of the selected line(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components. Must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

    line: select_begin
    1
    line: select_end
    line: rgb 1 0 0

See Also:

    Associated line commands
Command:

```
line: select_all
```

Purpose:

Selects all of the annotation lines as the target for future `line: commands`.

Parameters:

```
none
```

Example Usage:

```
line: select_all
line: delete
```

See Also:

Associated `line` commands
Command:

```
line: select_begin
<index1 index2 ... indexN>
line: select_end
```

Purpose:

Selects one or more lines in the graphics window as the target for future line commands.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>indexN</td>
<td>up to a maximum of 10 values per line</td>
</tr>
</tbody>
</table>

Notes:

Using these commands is equivalent to selecting lines by clicking on them in the graphics window with the CTRL key held down.

Example Usage:

```
line: select_begin
  1 2
line: select_end
line: rgb 1 0 0
```

See Also:

Associated line commands
log output

Command:

    line: select_default

Purpose:

    Causes any following line: commands to affect the default settings, rather than a particular line.

Parameters:

    none

Notes:

    All line: commands following line: select_default will affect default settings until a new line is selected using line: select_begin/select_end.

Example Usage:

    line: select_default
    line: visible OFF
    line: rgb 1 0 0
    line: select_begin
      1
    line: select_end

See Also:

    Associated line commands
Command:

```
line: visible <toggle>
```

Purpose:

Controls the visibility of the selected lines in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Lines are visible by default.

Example Usage:

```
line: select_begin
1
line: select_end
line: visible ON
```

See Also:

Associated line commands
Command:

```plaintext
line: width <width>
```

Purpose:

Sets the width of the currently selected line.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>width (in pixels) can be any value from 1 to 4</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
line: select_begin
1
line: select_end
line: width 2
```

See Also:

Associated line commands
Commands in this Section:

**logo**

- logo: delete
- logo: location_x <coord>
- logo: location_y <coord>
- logo: modify_begin
- logo: modify_end
- logo: new_logo <filename>
- logo: scale <x_val> <y_val>
- logo: select_all
- logo: select_begin
- logo: select_end
- logo: select_default
- logo: visible <toggle>

See Also:

User Manual - Section 8.2, Annot Mode
How To Load Custom Logos
**Command:**

```
logo: delete
```

**Purpose:**

Deletes the currently selected logo(s) in the graphics window.

**Parameters:**

none

**Example Usage:**

```
logo: select_begin
  1 2 3
logo: select_end
logo: delete
```

**See Also:**

Associated `logo` commands
Command:

```
logo: location_x <coord>
logo: location_y <coord>
```

Purpose:

Specifies the x/y coordinate of the selected logo in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>coord</td>
<td>A value of 0.0 indicates the left/bottom of the window, while a value of 1.0 indicates the right/top side</td>
</tr>
</tbody>
</table>

Notes:

The lower left corner of the logo will be positioned at this point (x,y).

Example Usage:

```
logo: select_begin
1
logo: select_end
logo: location_x 0.5
logo: location_y 0.5
```

See Also:

Associated logo commands
**Command:**

```logo
logo: modify_begin
logo: modify_end
```

**Purpose:**

These optional commands can be used to demarcate a series of `logo:` commands which apply to the same logo or logos, so that they can be executed at one time for better performance.

**Parameters:**

none

**Example Usage:**

```logo
logo: select_begin
1
logo: select_end
logo: modify_begin
logo: rgb 1 0 0
logo: location_x 100
logo: location_y 20
logo: modify_end
```

**See Also:**

Associated `logo` commands
**Command:**

```
logo: new_logo <filename>
```

**Purpose:**

Creates a new logo in the graphics window.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>path to the logo file</td>
</tr>
</tbody>
</table>

**Notes:**

The logo file can be any valid XPM file. The filename does not have to include an ".xpm" extension.

**Example Usage:**

```
logo: new_logo /usr/tmp/mylogo.xpm
logo: location_x 0.5
logo: location_y 0.6
```

**See Also:**

Associated `logo` commands
**Command:**

```plaintext
go: scale  <x_val> <y_val>
```

**Purpose:**

Scales the selected logo up or down in x and y dimensions

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_val</td>
<td>Can be any value between 0 and infinity, with a value of one specifying no change, values less than one specifying shrinkage and values greater than one specifying expansion.</td>
</tr>
<tr>
<td></td>
<td>y_val</td>
<td>Can be any value between 0 and infinity, with a value of one specifying no change, values less than one specifying shrinkage and values greater than one specifying expansion.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
go: new_logo /usr/tmp/mylogo.xpm
ogo: location_x  0.5
ogo: location_y  0.6
ogo: scale 2.5  2
```

**See Also:**

Associated **logo** commands
Command:

    logo: select_all

Purpose:

Selects all of the logos in the graphics window as the target for future logo commands.

Parameters:

    none

Example Usage:

    logo: select_all
    logo: delete

See Also:

    Associated logo commands
**logo: select_begin/end**

**Command:**

```
logo: select_begin
<index1 index2 ...indexN>
logo: select_end
```

**Purpose:**

Selects one or more logos in the graphics window as the target for future `logo:` commands.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>indexN</td>
<td>up to a maximum of 10 values per line</td>
</tr>
</tbody>
</table>

**Notes:**

Using these commands is equivalent to selecting logos by clicking on them in the graphics window with the CTRL key held down.

**Example Usage:**

```
logo: select_begin
  1 2
logo: select_end
logo: rgb 1 0 0
```

**See Also:**

Associated `logo` commands
Command:

```
logo: select_default
```

Purpose:
Causes any following `logo:` commands to affect the default settings, rather than a particular `logo`.

Parameters:
none

Notes:
All `logo:` commands following `logo: select_default` will affect default settings until a new `logo` is selected using `logo: select_begin`.

Example Usage:
```
logo: select_default
logo: visible OFF
logo: rgb 1 0 0
logo: select_begin
1
logo: select_end
```

See Also:
Associated `logo` commands
logo: visible

Command:

    logo: visible <toggle>

Purpose:

Controls the visibility of the selected logo in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Logos are visible by default.

Example Usage:

    logo: select_begin
    logo: select_end
    logo: visible ON

See Also:

Associated logo commands
Commands in this Section:

material

material: begin
material: create
material: end
material: select_bname_begin
material: select_bname_end
material: select_default
material: subdivide <level>
material: type <type>

See Also:

User Manual - Section 7.18, Material Parts Create/Update
How To Create Material Parts
material: begin/end

**Command:**

```
material: begin
material: end
```

**Purpose:**

Delimit the modifications for material part attributes.

**Parameters:**

none

**Example Usage:**

```
# # Select the parent part #
part: select_begin
  1
part: select_end
# #
material: begin #
# # create a domain type material part #
material: type domain
material: subdivide 2 #
# # use the two materials shown #
material: select_byname_begin
  matl_02
  matl_03
material: select_byname_end
material: end
material: create
```

**See Also:**

Associated [material commands](#)
Command:

    material: create

Purpose:

Create a material part with the currently defined attributes using the currently selected parts as parent parts.

Parameters:

none

Example Usage:

```
# # Select the parent part
# part: select_begin
1
part: select_end
#
material: begin
#
# create a domain type material part
#
material: type domain
material: subdivide 2
#
# use the two materials shown
#
material: select_byname_begin
matl_02
matl_03
material: select_byname_end
material: end
material: create
```

See Also:

Associated material commands
**Command:**

```en
material: selectbyname_begin
material: selectbyname_end
```

**Purpose:**

Delimit material name selection.

**Parameters:**

none

**Example Usage:**

```en
# # Select the parent part
# part: select_begin
1
part: select_end
#
material: begin
#
# # create a domain type material part using materials matl_02 and matl_03
# material: type domain
material: subdivide 2
#
# # use the two materials shown
#
material: selectbyname_begin
matl_02
matl_03
material: selectbyname_end
material: end
material: create
```

**See Also:**

Associated material commands
Command:

    material: select_default

Purpose:

Sets the target to the default settings for subsequent attribute modifications.

Parameters:

    none

Example Usage:

    material: select_default
    part: modify_begin
    material: type domain
    part: modify_end

See Also:

    Associated material commands
material: subdivide

Command:

```
material: subdivide <level>
```

Purpose:

Set the accuracy of the resulting material part - higher values result in higher fidelity.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>level</td>
<td>higher values result in higher accuracy</td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select the parent part
# part: select_begin
  1
part: select_end
#
material: begin
#
# create a domain type material part
# material: type domain
material: subdivide 2
#
# use the two materials shown
#
material: select_byname_begin
matl_02
matl_03
material: select_byname_end
material: end
material: create
```

See Also:

Associated material commands
Command:

```
material: type <type>
```

Purpose:

Set the resulting material part to be a domain or interface through/between the material selected.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>domain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>create a domain interface part</td>
</tr>
<tr>
<td></td>
<td>interface</td>
<td>interface between the material</td>
</tr>
</tbody>
</table>

Example Usage:

```
#
# Select the parent part
#
part: select_begin
1
part: select_end
#
material: begin
#
# create a domain type material part
#
material: type domain
material: subdivide 2
#
# use the two materials shown
#
material: select_byname_begin
matl_02
matl_03
material: select_byname_end
material: end
material: create
```

See Also:

Associated material commands
material: type
Commands in this Section:

message-window

message-window: clear
message-window: save <filename>

See Also:

User Manual - Section 2.13, Saving Query Text Information
**Command:**

```
message-window: clear
```

**Purpose:**

Cleans the EnSight Message Window dialog

**Parameters:**

none

**Example Usage:**

```
message-window: clear
```

**See Also:**

Associated `message-window` commands
Command:

```
message-window: save <filename>
```

Purpose:

Saves the contents of the EnSight Message Window dialog to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>filename into which the contents of the message window is to be saved.</td>
</tr>
</tbody>
</table>

Example Usage:

```
message-window: save /home/users/me/myfile.txt
```

See Also:

Associated `message-window` commands
message-window: save
Commands in this Section:

model

model: ijk_axis <toggle>
model: ijk_axis_scale <scale_value>
model: noderangestep_i <val1> <val2> <val3>
model: noderangestep_j <val1> <val2> <val3>
model: noderangestep_k <val1> <val2> <val3>
model: select_default

See Also:

User Manual - Section 2.1, Internal Readers
How To Read EnSight Gold Data
How To Read EnSight 6 Data
How To Read ESTET Data
How To Read PLOT3D Data
**model: ijk_axis visibility**

**Command:**

model: ijk_axis <toggle>

**Purpose:**

Toggles the visibility of an IJK axis attached to structured parts.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON axis visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF axis invisible</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
part: select_begin
1
part: select_end
part: modify_begin
model: ijk_axis ON
part: modify_end
part: modify_begin
model: ijk_axis_scale 1.0000e+00
part: modify_end
```

**See Also:**

Associated model commands
Command:

model: ijk_axis_scale <scale_value>

Purpose:

Scales an IJK axis attached to structured parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale_value</td>
<td>scale factor</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
part: select_begin
  1
part: select_end
part: modify_begin
model: ijk_axis ON
part: modify_end
part: modify_begin
model: ijk_axis_scale 1.0000e+00
part: modify_end
```

See Also:

Associated model commands
model: noderangestep_i/j/k

Command:

model: noderangestep_i <val1> <val2> <val3>
model: noderangestep_j <val1> <val2> <val3>
model: noderangestep_k <val1> <val2> <val3>

Purpose:

Sets the IJK range and step for a structured part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>val1</td>
<td>minimum I, J, K coordinate</td>
</tr>
<tr>
<td></td>
<td>val2</td>
<td>maximum I, J, K coordinate</td>
</tr>
<tr>
<td></td>
<td>val3</td>
<td>I, J, K stride</td>
</tr>
</tbody>
</table>

Notes:

To speed interactive operations on structured data sets, only a portion of the model can be loaded. At a later point the entire model can be loaded.

Example Usage:

```plaintext
# partial load a structured Plot3D part
data_partbuild: data_type structured
data_partbuild: select_begin
1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 40
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 45
data_partbuild: nodestep 10 1 1
data_partbuild: nodedelta000
data_partbuild: description partial grid
data_partbuild: create
data_partbuild: end
part: select_all
part: modify_begin
# load every other i coordinate
model: noderangestep_i 1 40 2
model: noderangestep_j 1 63 1
model: noderangestep_k 1 45 1
part: modify_end
part: modify_begin
# load all i coordinates
model: noderangestep_i 1 80 1
model: noderangestep_j 1 63 1
model: noderangestep_k 1 45 1
part: modify_end
```

See Also:

Associated model commands
Command:

model: select_default

Purpose:

Sets default attribute values for model parts

Parameters:

none

Notes:

model commands that follow this one set default values for new model parts loaded at a latter time during the current session.

Example Usage:

```plaintext
model: select_default
part: modify_begin
part: bounding_rep points
part: modify_end
part: modify_begin
model: ijk_axis ON
part: modify_end
data: binary_files_are big_endian
data: format plot3d
data: plot3dblank OFF
data: plot3dmulti_zone OFF
data: plot3dread as c_binary
data: plot3ddimension 3d
data: path /usr/local/bin/ensight76/data/e7data/plot3d
data: geometry shuttle.xyz
data: result shuttle.q
data_partbuild: begin
data: read
data_partbuild: data_type structured
data_partbuild: select_begin
  1
data_partbuild: select_end
data_partbuild: domain all
data_partbuild: noderange_i 1 80
data_partbuild: noderange_j 1 63
data_partbuild: noderange_k 1 45
data_partbuild: nodestep 1 1 1
data_partbuild: nodedelta 0 0 0
data_partbuild: description
data_partbuild: create
data_partbuild: end
view_transf: rotate -2.848098 21.765417 0.000000
view_transf: function global
```

See Also:

Associated model commands
model: select_default
Commands in this Section:

part

part: active <toggle>
part: allow_default_editing <toggle>
part: bounding_rep <type>
part: clip <toggle>
part: colorby_palette <varname>
part: colorby_rgb <red_val> <grn_val> <blu_val>
part: colorby_selected_var
part: copy
part: create_assign_viewport
part: create_assign_viewports
part: delete
part: description <desc>
part: displace_factor <disp_factor>
part: displace_by <variable_name>
part: elt_feature_angle <angle>
part: elt_representation <type>
part: elt_shrink_factor <scale_factor>
part: entity_label_elt <toggle>
part: entity_label_node <toggle>
part: extract
part: fill_pattern <pattern_num>
part: get_mainpartlist_select
part: group <groupname>
part: hidden_line <toggle>
part: hidden_surface <toggle>
part: light_diff <diffuse>
part: light_h_int <intensity>
part: light_shin <shiny>
part: line_style <style>
part: line_width <width>
part: merge
part: mirror_original <toggle>
part: mirror_x <toggle>
part: mirror_y <toggle>
part: mirror_z <toggle>
part: mirror_xy <toggle>
part: mirror_yz <toggle>
part: mirror_xz <toggle>
part: mirror_xyz <toggle>
part: modify_begin
part: modify_end
part: node_detail <level>
part: node_scale <scale>
part: node_sizeby <source_type>
part: node_type <type>
part: node_variable <variable_name>
part: opaqueness <value>
part: reduce_polygons <toggle>
model: select_default

part: reduce_polygons_factor <factor>
part: ref_frame <frame#>
part: select_all
part: select_all_case
part: select_all_default
part: select_begin
part: select_end
part: select_default
part: select_lastcreatedpart
part: select_lastonecreated
part: select_mainpartlist_all
part: select_partexpr_begin
part: select_partexpr_end
part: select_partname_begin
part: select_partname_end
part: shading <type>
part: symmetry_angle <angle>
part: symmetry_axis <axis>
part: symmetry_mirror_x <toggle>
part: symmetry_mirror_y <toggle>
part: symmetry_mirror_z <toggle>
part: symmetry_mirror_xy <toggle>
part: symmetry_mirror_xz <toggle>
part: symmetry_mirror_yz <toggle>
part: symmetry_mirror_xyz <toggle>
part: symmetry_rinstances <num>
part: symmetry_type <sym_type>
part: ungroup
part: updtparts <parent>
part: viewport_vis <toggle> <vport1>...<vportN>
part: visibility_elt <toggle>
part: visibility_line <toggle>
part: visibility_node <toggle>
part: visible <toggle>

See Also:

User Manual - Section 8.1, Part Mode
User Manual - Chapter 3, Parts
How To Set Attributes
How To Display Displacements
How To Change Color
How To Copy a Part
How To Group Parts
How To Merge Parts
How To Extract Part Representation
How To Delete a Part
How To Change the Visual Representation
How To Display Labels
How To Set Transparency
How To Set Symmetry
How To Select Parts
part: active

Command:

```
part: active <toggle>
```

Purpose:

Activates or deactivates the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

When a part is deactivated, the data for that part will not be updated from the server on any future timestep changes, until the part is activated again.

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: active OFF
part: modify_end
```

See Also:

Associated part commands
Command:

```
part: allow_default_editing <toggle>
```

Purpose:
Allow or disallow editing of part defaults.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON allow editing of part defaults</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF do not allow editing of part defaults</td>
</tr>
</tbody>
</table>

Notes:
This is a command for preferences and is written out in the ensight_allparts_prefs.def file.

If the user edits a part attribute when no parts are selected the default is normally edited. With this toggle OFF the user will no be able to edit part defaults.

Example Usage:
```
part: allow_default_editing OFF
```

See Also:
Associated part commands
part: bounding_rep

Command:

```
part: bounding_rep <type>
```

Purpose:

Specifies the type of fast-display representation used to for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>Can have any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF specifies display according to the currently specified Element Representation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>box specifies a bounding (Cartesian extent) box of all part elements (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>points specifies point cloud representation of the part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sparse_model specifies sparse model representation of the part</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: bounding_rep sparse_model
part: modify_end
```

See Also:

Associated part commands
Command:

```
part: clip <toggle>
```

Purpose:

Turns auxiliary clipping on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

The global toggle for auxiliary clipping must be on - See `view: clipping`

Example Usage:

```
view: clipping ON
part: select_begin
  1
part: select_end
part: modify_begin
part: clip ON
part: modify_end
```

See Also:

Associated `part` commands
part: colorby_palette

Command:

    part: colorby_palette <varname>

Purpose:

    Colors the currently selected part(s) based on the value of the specified variable at each node or element (depending on whether data is node or element based)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>varname</td>
<td>the name of an existing variable (or the word &quot;none&quot;)</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: colorby_palette pressure
    part: modify_end

See Also:

    Associated part commands
Command:

part: colorby_rgb <red_val> <grn_val> <blu_val>

Purpose:
Colors the currently selected part(s) using the specified rgb value.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components (must be between 0.0 and 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: colorby_rgb 1.0 0.4 0.0
part: modify_end

See Also:

Associated part commands
part: colorby_selected_var

Command:

```
part: colorby_selected_var
```

Purpose:

Colors a part by the palette tied to the variable selected in the main variable list.

Parameters:

None.

Notes:

Used with the HUM to tie parts selected to variables selected.

Example Usage:

```
variables: get_mainvarlist_select
part: get_mainpartlist_select
part: modify_begin
part: colorby_selected_var
part: modify_end
```

See Also:

Associated part commands
**Command:**

```
part: copy
```

**Purpose:**

Creates a copy of the currently selected part(s).

**Parameters:**

None.

**Notes:**

The Copy operation creates a dependent copy of the original part.

The copy is created on the client and its existence is not known to the EnSight Server process. A copy shares geometric data and variable data with the original part.

**Example Usage:**

```
part: select_begin
1
part: select_end
part: copy
```

**See Also:**

Associated `part` commands
part: create_assign_viewport

Command:

part: create_assign_viewport

Purpose:

Creates a new viewport and assigns the currently selected part(s) to it.

Parameters:

None.

Example Usage:

part: select_begin
3 5
part: select_end
part: create_assign_viewport

See Also:

Associated part commands
Command:

```
part: create_assign_viewports
```

Purpose:

Creates a new viewport for each of the currently selected part(s) and assigns one part to each viewport.

Parameters:

None.

Example Usage:

```
part: select_begin
  3 5
part: select_end
part: create_assign_viewports
```

See Also:

Associated part commands
part: delete

Command:

    part: delete

Purpose:

    Deletes the currently selected part(s).

Parameters:

    None

Example Usage:

    part: select_begin
    1
    part: select_end
    part: delete

See Also:

    Associated part commands
Command:

```
part: description <desc>
```

Purpose:
Specifies a description string for the currently selected part. This string will appear in lists that include the part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>name that will show up in the user interface; can be up to 50 characters in length</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: description compressor inlet
part: modify_end
```

See Also:

Associated `part` commands
**part: displace_factor**

**Command:**

```
part: displace_factor <disp_factor>
```

**Purpose:**

Specifies the displacement factor to be applied to the source variable to calculate displacement for the currently selected part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>disp_factor</td>
<td>the scaling factor that will be applied to the displacement values.</td>
</tr>
</tbody>
</table>

**Notes:**

The displacement factor can be changed before or after the `part: displace_by` command is issued.

**Example Usage:**

```
part: select_begin
1
part: select_end
part: modify_begin
part: displace_factor 0.9
part: displace_by pressure
part: modify_end
```

**See Also:**

Associated `part` commands
Command:

```
part: displace_by <variable_name>
```

Purpose:

Specifies the variable to be used to displace the nodes and elements of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of an activated variable</td>
</tr>
</tbody>
</table>

Notes:

The displacement factor can be changed before or after the `part: displace_by` command is issued.

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: displace_factor 0.9
part: displace_by pressure
part: modify_end
```

See Also:

Associated `part` commands
part: elt_feature_angle

Command:

    part: elt_feature_angle <angle>

Purpose:

    Specifies the angle to be used in feature angle element representation for the currently selected
    part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>angle</td>
<td>angle between adjacent polygons, above which the edge will be drawn, below which the edge will not be drawn. the range is 0.0 to 180.0 degrees</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: elt_representation feature_angle
    part: elt_feature_angle 20.0
    part: modify_end

See Also:

    Associated part commands
Command:

```command
part: elt_representation <type>
```

Purpose:

Specifies the type of element representation used for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>can have any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3D_border_2D_full represents the Part's 3D elements in Border representation, the Part's 1 and 2D elements in Full representation. The outside surfaces of the Part are displayed along with all bar elements.</td>
</tr>
<tr>
<td>border</td>
<td></td>
<td>represents the Part's 3D elements with 2D elements corresponding to unshared element faces, the Part's 2D elements with 1D elements corresponding to the unshared edges, and the Part's 1D elements as 1D elements. The outside faces and edges of the Part's elements are displayed.</td>
</tr>
<tr>
<td>feature angle</td>
<td></td>
<td>first runs the 3D border, 2D full representation to get a list of 1 and 2D elements. The 1D elements and all non-shared 2D edges will be shown, but only the shared edges above the Angle value will be shown. The result consists of 1D elements visualizing the sharp edges of the Part.</td>
</tr>
<tr>
<td>full</td>
<td></td>
<td>represents all faces of the part's 3D elements, and all the 1 and 2D elements</td>
</tr>
<tr>
<td>not_loaded</td>
<td></td>
<td>part exists on the server, but is not loaded on the client. Not loaded parts may be used as parent parts, but do not exist on the client</td>
</tr>
<tr>
<td>bounding_box</td>
<td></td>
<td>represents all part elements as a bounding box surrounding the Cartesian extent of the elements of the part</td>
</tr>
</tbody>
</table>

Example Usage:

```command
part: select_begin
1
part: select_end
part: modify_begin
part: elt_representation full
part: modify_end
```

See Also:

Associated `part` commands
part: elt_shrink_factor

Command:

part: elt_shrink_factor <scale_factor>

Purpose:

Specifies a scaling factor (fraction) by which to shrink every element toward its centroid.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale_factor</td>
<td>shrinkage factor which must be within the range of 0.0 to 1.0. The default is 0.0 for no shrinkage. If set to 1.0, elements will completely disappear.</td>
</tr>
</tbody>
</table>

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: elt_shrink_factor 0.5
part: modify_end

See Also:

Associated part commands
Command:

```
part: entity_label_elt <toggle>
```

Purpose:

Turns element labeling on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: entity_label_elt ON
part: modify_end
```

See Also:

Associated `part` commands
part: entity_label_node

Command:

part: entity_label_node <toggle>

Purpose:

Turns node labeling on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: entity_label_node ON
part: modify_end

See Also:

Associated part commands
Command:

```
part: extract
```

Purpose:

Creates an extract of the currently selected part(s).

Parameters:

None.

Notes:

Extracts a new part from the selected part(s) using the part representation in effect at the time (full, border, or feature). If more than one part is selected, then they are joined into a single part which is assigned to Frame 0.

The `part: extract` command creates a new part using the geometry of the current representation (what you see is what you get). Extracted parts which are in Full Representation are actual copies of the original, but extracted parts which are in Border Representation are only the shell or boundary of the original.

Example Usage:

```
part: select_begin
1
part: select_end
part: extract
```

See Also:

Associated `part` commands
part: fill_pattern

Command:

    part: fill_pattern <pattern_num>

Purpose:

Specifies a fill pattern of variable transparency to be used on the surfaces of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>integer value</td>
<td>pattern_num</td>
<td>must be within the range of 0 to 3. transparency value of 0 specifies an opaque surface, while a value of 3 specifies a sparse (transparent) fill pattern</td>
</tr>
</tbody>
</table>

Notes:

This command provides a means of simulating surface transparency which requires less computation than true transparency. Part opaqueness (controlled by the part: opaqueness command) must be 1.0 in order for part: fill_pattern to take effect.

Example Usage:

    view: hidden_surface ON
    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: hidden_surface ON
    part: fill_pattern 2
    part: modify_end

See Also:

Associated part commands
Command:

part: get_mainpartlist_select

Purpose:

Causes the parts highlighted in the main part list to become the currently selected parts.

Parameters:

None.

Example Usage:

part: get_mainpartlist_select
part: modify_begin
part: mirror_original OFF
part: colorby_rgb 1 0 0
part: modify_end

See Also:

Associated part commands
part: group

Command:

```
part: group <groupname>
```

Purpose:

Groups the currently selected parts into a group with the specified name.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string value</td>
<td>groupname</td>
<td>name of the group</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
3 5
part: select_end
part: group yinyang
```

See Also:

Associated `part` commands
part: hidden_line

Command:

`part: hidden_line <toggle>`

Purpose:

Causes lines which are behind any portion of the currently selected part(s) to not be drawn.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

The `part: hidden_line` command also causes the visible drawing lines to be rendered on shaded surfaces of the currently selected part(s). `View: hidden_line ON` must be issued in order for `part: hidden_line ON` to take effect.

Example Usage:

```plaintext
view: hidden_line ON
part: select_begin
1
part: select_end
part: modify_begin
part: hidden_line ON
part: modify_end
```

See Also:

Associated `part` commands
part: hidden_surface

Command:

```
part: hidden_surface <toggle>
```

Purpose:
Causes the currently selected part(s) to be drawn with shaded surfaces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

View: hidden_surface ON must be issued in order for part: hidden_surface ON to take effect.

Example Usage:

```plaintext
view: hidden_surface ON
part: select_begin
1
part: select_end
part: modify_begin
part: hidden_surface ON
part: modify_end
```

See Also:
Associated part commands
Command:

```
part: light_diff <diffuse>
```

Purpose:

Specifies the lighting diffusion value used in shading the surfaces of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>diffuse</td>
<td>diffuse light value, must be within the range of 0.0 to 1.0</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: light_diff 0.9
part: modify_end
```

See Also:

Associated `part` commands
part: light_h_int

Command:

    part: light_h_int <intensity>

Purpose:

Specifies the highlight intensity value used in shading the surfaces of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>intensity</td>
<td>highlight intensity, must be within the range of 0.0 to 1.0</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin 1
    part: select_end
    part: modify_begin
    part: light_h_int 0.5
    part: modify_end

See Also:

Associated part commands
Command:

```
part: light_shin <shiny>
```

Purpose:

Specifies the "shinyness" value used in shading the surfaces of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>shiny</td>
<td>&quot;shinyness&quot; value, must be within the range of 1.0 to 100.0. Lower values specify less shine</td>
</tr>
</tbody>
</table>

Notes:

Highlight intensity (`part: light_h_int`) must be non-zero for shinyness to have any effect.

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: light_h_int 0.9
part: light_shin 50.0
part: modify_end
```

See Also:

Associated `part` commands
part: line_style

Command:

    part: line_style  <style>

Purpose:

Specifies the line style used to draw the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>style</td>
<td>can have any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dot-dash</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: line_style dotted
    part: modify_end

See Also:

Associated part commands
Command:

\texttt{part: line\_width <width>}

Purpose:

Specifies the line width in pixels used to draw the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>pixel width of line; must be within the range of 1 to 4.</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select\_begin
1
part: select\_end
part: modify\_begin
part: line\_width 2
part: modify\_end
```

See Also:

Associated \texttt{part} commands
part: merge

Command:

    part: merge

Purpose:

    Merges the currently selected parts into a single part.

Parameters:

    None.

Example Usage:

    part: select_begin
    3 5
    part: select_end
    part: merge

See Also:

    Associated part commands
part: mirror_original

**Command:**

```
part: mirror_original <toggle>
```

**Purpose:**

Turns visibility of the non-mirrored currently selected parts on or off.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

This command is normally used to remove the original image of parts which have been mirrored in one or more dimensions.

**Example Usage:**

```
part: select_begin
1
part: select_end
part: modify_begin
part: mirror_z ON
part: mirror_original OFF
part: modify_end
```

**See Also:**

Associated `part` commands
part: mirror_x/y/z/xy/yz/xz/xyz

Command:

    part: mirror_x <toggle>
    part: mirror_y <toggle>
    part: mirror_z <toggle>
    part: mirror_xy <toggle>
    part: mirror_yz <toggle>
    part: mirror_xz <toggle>
    part: mirror_xyz <toggle>

Purpose:

    Set the flag for mirror images of currently selected parts in the x / y / z / xy / yz / xz / xyz directions.  
    (Note: These commands have been superceded by: part: symmetry_mirror_ ...)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

    The part is reflected about the frame that it is assigned to (part: ref_frame)

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: mirror_x ON
    part: mirror_y ON
    part: mirror_xy ON
    part: mirror_xz ON
    part: mirror_xyz ON
    part: modify_end

See Also:

    Associated part commands
Command:

```en
part: modify_begin
...
part: modify_end
```

Purpose:

These commands are used to demarcate part attribute changing commands. The attributes within them will be changed when the modify_end is reached.

Parameters:

None

Example Usage:

```en
part: select_begin
1
part: select_end
part: modify_begin
part: colorby_rgb 1 0 0
part: visibility_node ON
part: node_type Sphere
part: modify_end
```

See Also:

Associated part commands
part: node_detail

Command:

    part: node_detail <level>

Purpose:

Sets the detail level for drawing spherical nodes in the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>level</td>
<td>detail level for the spheres used to represent the nodes; must be within the range of 2 to 10.</td>
</tr>
</tbody>
</table>

Notes:

Higher values of level result in more polygons being used to draw the spheres.

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: node_type sphere
    part: node_detail 5
    part: modify_end

See Also:

Associated part commands
Command:

```
part: node_scale <scale>
```

Purpose:

Sets the scale factor used to determine node size for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale</td>
<td>scaling factor to be applied to the node cross or sphere representation; can be any valid floating point value</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: node_scale 1.5
part: modify_end
```

See Also:

Associated part commands
part: node_sizeby

Command:

    part: node_sizeby <source_type>

Purpose:

Selects the source for calculating node size in the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>source_type</td>
<td>Can have any of the following values:</td>
</tr>
<tr>
<td></td>
<td>constant</td>
<td>size will be constant, controlled by the scale factor</td>
</tr>
<tr>
<td></td>
<td>scalar</td>
<td>size will be controlled by a scalar variable and the scale factor</td>
</tr>
<tr>
<td></td>
<td>vector_mag</td>
<td>size will be controlled by the magnitude of a vector variable and the scale factor</td>
</tr>
<tr>
<td></td>
<td>vector_xcomp</td>
<td>size will be controlled by the x component of a vector variable and the scale factor</td>
</tr>
<tr>
<td></td>
<td>vector_ycomp</td>
<td>size will be controlled by the y component of a vector variable and the scale factor</td>
</tr>
<tr>
<td></td>
<td>vector_zcomp</td>
<td>size will be controlled by the z component of a vector variable and the scale factor</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: node_type sphere
    part: node_sizeby vector_mag
    part: node_variable velocity
    part: modify_end

See Also:

Associated part commands
Command:

\texttt{part: node\_type \textless type\textgreater}

Purpose:

Selects the node representation mode for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>dot</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cross</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sphere</td>
</tr>
</tbody>
</table>

Example Usage:

\texttt{part: select\_begin}
\texttt{1}
\texttt{part: select\_end}
\texttt{part: modify\_begin}
\texttt{part: node\_type sphere}
\texttt{part: modify\_end}

See Also:

Associated \texttt{part} commands
part: node_variable

Command:

    part: node_variable <variable_name>

Purpose:

Specifies the variable to be used in calculating the size of spherical nodes in the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>the name of an activated variable</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: node_type sphere
    part: node_sizeby vector_mag
    part: node_variable velocity
    part: modify_end

See Also:

Associated part commands
**Command:**

    part: opaqueness <value>

**Purpose:**

Specifies the opaqueness of the currently selected part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>opaqueness; must be within the range of 0.0 to 1.0</td>
</tr>
</tbody>
</table>

**Notes:**

A value of 1.0 is fully opaque.

**Example Usage:**

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: opaqueness 0.4
    part: modify_end

**See Also:**

Associated part commands
part: reduce_polygons

Command:

```
part: reduce_polygons <toggle>
```

Purpose:

Reduce the number of polygons for display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: reduce_polygons_factor 1
part: reduce_polygons ON
part: modify_end
```

See Also:

Associated `part` commands
part: reduce_polygons_factor

Command:

part: reduce_polygons_factor <factor>

Purpose:

Set the polygon reduction factor.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>factor</td>
<td>0 (less) to 10 (more) controlling the number of polygons</td>
</tr>
</tbody>
</table>

Notes:

Used only if reduce_polygons is ON

If no polygons were removed during the process the original geometry will be shown.

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: reduce_polygons_factor 1
part: reduce_polygons ON
part: modify_end

See Also:

Associated part commands
part: ref_frame

Command:

```
part: ref_frame <frame#>
```

Purpose:

Assigns the currently selected part(s) to the specified reference frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>frame#</td>
<td>an existing reference frame number</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1 2 5
part: select_end
part: modify_begin
part: ref_frame 2
part: modify_end
```

See Also:

Associated part commands
Command:

part: select_all

Purpose:

Selects all parts as the target for future `part:` commands.

Parameters:

None.

Example Usage:

```
part: select_all
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end
```

See Also:

Associated `part` commands
part: select_all_case

Command:

    part: select_all_case

Purpose:

Selects all parts in the current case as the target for future part: commands.

Parameters:

None.

Example Usage:

    part: select_all_case
    part: modify_begin
    part: colorby_rgb 1 0 0
    part: modify_end

See Also:

Associated part commands
Command:

`part: select_all_default`

Purpose:

Causes any following part editing commands to affect the default settings for all parts of any type.

Parameters:

None

Notes:

All `part` commands following `part: select_all_default` will affect default settings until a new part is selected using `part: select_begin/end`.

Example Usage:

```
part: select_all_default
part: modify_begin
part: mirror_original OFF
part: colorby_rgb 1 0 0
part: modify_end
```

See Also:

Associated `part` commands
**part: select_begin/end**

**Command:**

```
part: select_begin
<pn1 pn2 ...pnN>
part: select_end
```

**Purpose:**

Selects one or more parts as the target for future `part:` commands.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>pnN</td>
<td>part number(s). Up to a maximum of 10 per line, but can use as many lines as needed.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
part: select_begin
  1 2
part: select_end
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end
```

**See Also:**

Associated `part` commands.
Command:

```
part: select_default
```

Purpose:

Causes any following part editing commands to affect the default settings for all parts belonging to
the part type of the next edit command.

Parameters:

None

Notes:

All part editing commands following `part: select_default` will affect default settings until a
new part is selected using `part: select_begin/select_end`.

Example Usage:

```
part: select_default
part: modify_begin
part: mirror_original OFF
part: colorby_rgb 1 0 0
part: modify_end
```

See Also:

Associated `part` commands
Command:

part: select_lastcreatedpart

Purpose:

Selects all of the parts created in the last part-creating operation.

Parameters:

None.

Example Usage:

part: select_lastcreatedpart
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end

See Also:

Associated part commands
Command:

```
part: select_lastonecreated
```

Purpose:

Selects the last single part from the last part-creating operation.

Parameters:

None.

Example Usage:

```
part: select_lastonecreated
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end
```

See Also:

Associated `part` commands
part: select_mainpartlist_all

Command:

part: select_mainpartlist_all

Purpose:

Causes all parts in the main part list to be highlighted. Note that this does NOT cause the parts to be selected as the target for future part: commands.

Parameters:

None.

Notes:

To make the highlighted parts the currently selected parts, use part: get_mainpartlist_select or part: select_all.

Example Usage:

part: select_mainpartlist_all
part: get_mainpartlist_select
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end

See Also:

Associated part commands
Command:

```
part: select_partexpr_begin
<expr1> <expr2> ...<exprN>
part: select_partexpr_end
```

Purpose:

Selects parts using an expression.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>exprN</td>
<td>part expression (partial name with asterisk(s))</td>
</tr>
</tbody>
</table>

Notes:

Is used in command files only, i.e., EnSight does not generate these commands

Example Usage:

```
part: select_partexpr_begin
flui*
soli*
part: select_partexpr_end
part: modify_begin
part: reduce_polygons_factor 1
part: reduce_polygons ON
part: modify_end
```

See Also:

Associated part commands
Command:

```enlighten
part: select_partname_begin
<name1> <name2> ...<nameN>
part: select_partname_end
```

Purpose:

Selects parts by name.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>nameN</td>
<td>part name (as opposed to number)</td>
</tr>
</tbody>
</table>

Example Usage:

```enlighten
part: select_partname_begin
"impeller"
"main chamber"
"exhaust port"
part: select_partname_end
part: modify_begin
part: colorby_rgb 1 0 0
part: modify_end
```

See Also:

Associated part commands
**Command:**

```
part: shading <type>
```

**Purpose:**

Specifies the type of surface shading used on the currently selected part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>Can have any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>flat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>each element is a constant shade, no variation across it.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>gouraud</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shading varies across each element, using Gouraud method, but does not have to match its neighbors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>smooth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shading varies across each element, but additionally will match its neighbors at boundaries.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
view: hidden_surface ON
part: select_begin
1
part: select_end
part: modify_begin
part: hidden_surface ON
part: shading gouraud
part: modify_end
```

**See Also:**

Associated `part` commands
part: symmetry_angle

Command:

    part: symmetry_angle <angle>

Purpose:

    Specifies the rotational symmetry angle.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>angle</td>
<td>The angle (in degrees) for the rotation</td>
</tr>
</tbody>
</table>

Notes:

    Used only when part: symmetry_type is set to rotational.

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    #
    # turn on rotational symmetry about the x axis
    # use 4 instances rotated 90 degrees
    #
    part: symmetry_type rotational
    part: symmetry_axis x
    part: symmetry_rinstances 4
    part: symmetry_angle 90.
    part: modify_end

See Also:

    Associated part commands
Command:

\texttt{part: symmetry\_axis <axis>}

Purpose:

Specifies the rotational symmetry axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>x: rotation about the x axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y: rotation about the y axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z: rotation about the z axis</td>
</tr>
</tbody>
</table>

Notes:

Used only when \texttt{part: symmetry\_type} is set to rotational.

The axis is in reference to the part’s coordinate frame.

Example Usage:

\begin{verbatim}
part: select_begin
  1
part: select_end
part: modify_begin
  # turn on rotational symmetry about the x axis
  # use 4 instances rotated 90 degrees
  part: symmetry\_type rotational
  part: symmetry\_axis x
  part: symmetry\_rinstances 4
  part: symmetry\_angle 90.
part: modify\_end
\end{verbatim}

See Also:

Associated \texttt{part} commands
part: symmetry_mirror_x/y/z/xy/yz/xz/xyz

Command:

part: symmetry_mirror_x <toggle>
part: symmetry_mirror_y <toggle>
part: symmetry_mirror_z <toggle>
part: symmetry_mirror_xy <toggle>
part: symmetry_mirror_yz <toggle>
part: symmetry_mirror_xz <toggle>
part: symmetry_mirror_xyz <toggle>

Purpose:

Set the flag for visual symmetry mirror images of currently selected parts in the x / y / z / xy / yz / xz / xyz directions.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

The part is reflected about the frame that it is assigned to (part: ref_frame)

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: symmetry_mirror_x ON
part: symmetry_mirror_y ON
part: symmetry_mirror_xy ON
part: symmetry_mirror_yz ON
part: symmetry_mirror_xz ON
part: modify_end

See Also:

Associated part commands
part: symmetry_rinstances

Command:

\[ \text{part: symmetry_rinstances } <\text{num}> \]

Purpose:

Specifies the rotational instances.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>The number of rotational instances</td>
</tr>
</tbody>
</table>

Notes:

Used only when part: symmetry_type is set to rotational.

Example Usage:

```
part: select_begin
  1
part: select_end
part: modify_begin
#
# turn on rotational symmetry about the x axis
# use 4 instances rotated 90 degrees
#
part: symmetry_type rotational
part: symmetry_axis x
part: symmetry_rinstances 4
part: symmetry_angle 90.
part: modify_end
```

See Also:

Associated part commands
part: symmetry_type

Command:

    part: symmetry_type  <sym_type>

Purpose:

    Turn on symmetry display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>sym_type</td>
<td>mirror</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turn on mirror symmetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>rotational</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turn on rotational symmetry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turn off symmetry</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    #
    # turn on rotational symmetry about the x axis
    # use 4 instances rotated 90 degrees
    #
    part: symmetry_type rotational
    part: symmetry_axis x
    part: symmetry_rinstances 4
    part: symmetry_angle 90.
    part: modify_end

See Also:

    Associated part commands
Command:

part: ungroup

Purpose:

Ungroups the currently selected (grouped) parts.

Parameters:

None.

Example Usage:

part: select_begin
3 5
part: select_end
part: ungroup

See Also:

Associated part commands
part: updtparts

Command:

    part: updtparts <parent>

Purpose:

    Updates the parent part for the currently selected part(s)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>parent</td>
<td>part number of the new parent(s)</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    3 5
    part: select_end
    part: updtparts 2

See Also:

    Associated part commands
Command:

```
part: viewport_vis <toggle> <vport1>...<vportN>
```

Purpose:

Controls visibility of the currently selected part(s) in the specified viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td>vportN</td>
<td></td>
<td>viewport numbers in which to modify part visibility</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
1 2 5
part: select_end
part: modify_begin
part: viewport_vis OFF 1 3
part: modify_end
```

See Also:

Associated part commands
part: visibility_elt

Command:

part: visibility_elt <toggle>

Purpose:

Turns element visibility on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

part: select_begin
1
part: select_end
part: modify_begin
part: visibility_el  OFF
part: modify_end

See Also:

Associated part commands
Command:

```
part: visibility_line <toggle>
```

Purpose:

Turns line visibility on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

"Line" refers to the 1D bar elements.

Example Usage:

```
part: select_begin
1
part: select_end
part: modify_begin
part: visibility_line OFF
part: modify_end
```

See Also:

Associated `part` commands
part: visibility_node

Command:

    part: visibility_node <toggle>

Purpose:

Turns node visibility on or off for the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

    part: select_begin
    1
    part: select_end
    part: modify_begin
    part: visibility_node ON
    part: modify_end

See Also:

Associated part commands
Command:

    part: visible <toggle>

Purpose:

Controls the visibility of the currently selected part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
part: select_begin
1 2 5
part: select_end
part: modify_begin
part: visible OFF
part: modify_end
```

See Also:

Associated part commands
Commands in this Section:

plot

plot: auto_scale <toggle>
plot: axis_linewidth <width>
plot: axis_rgb <red_val> <grn_val> <blu_val>
plot: axis_swap_minmax <axis>
plot: axis_x_gridtype <grid_type>
plot: axis_x_labelformat <format>
plot: axis_x_labelrgb <red_val> <grn_val> <blu_val>
plot: axis_x_labelsize <size>
plot: axis_x_labeltype <label_type>
plot: axis_x_max <max>
plot: axis_x_min <min>
plot: axis_x_numgrid <num>
plot: axis_x_numsubgrid <num>
plot: axis_x_origin <origin>
plot: axis_x_scale <scale_type>
plot: axis_x_sgridtype <grid_type>
plot: axis_x_title <title>
plot: axis_x_titlergb <red_val> <grn_val> <blu_val>
plot: axis_x_titlesize <size>
plot: axis_x_visible <toggle>
plot: axis_y_gridtype <grid_type>
plot: axis_y_labelformat <format>
plot: axis_y_labelrgb <red_val> <grn_val> <blu_val>
plot: axis_y_labelsize <size>
plot: axis_y_labeltype <label_type>
plot: axis_y_max <max>
plot: axis_y_min <min>
plot: axis_y_numgrid <num>
plot: axis_y_numsubgrid <num>
plot: axis_y_origin <origin>
plot: axis_y_scale <scale_type>
plot: axis_y_sgridtype <grid_type>
plot: axis_y_title <title>
plot: axis_y_titlergb <red_val> <grn_val> <blu_val>
plot: axis_y_titlesize <size>
plot: axis_y_visible <toggle>
plot: background_rgb <red_val> <grn_val> <blu_val>
plot: background_type <type>
plot: border_rgb <red_val> <grn_val> <blu_val>
plot: border_visible <toggle>
plot: delete_plot
plot: grid_linetype <line_type>
plot: grid_linewidth <width>
plot: grid_rgb <red_val> <grn_val> <blu_val>
plot: height <height>
plot: legend_rgb <red_val> <grn_val> <blu_val>
plot: legend_textsize <size>
plot: legend_visible <toggle>
plot

plot: origin_x <coord>
plot: origin_y <coord>
plot: plot_title <title>
plot: select_all
plot: select_begin
plot: select_end
plot: select_default
plot: subgrid_linetype <line_type>
plot: subgrid_linewidth <width>
plot: subgrid_rgb <red_val> <grn_val> <blu_val>
plot: title_rgb <red_val> <grn_val> <blu_val>
plot: title_textsize <size>
plot: visible <toggle>
plot: width <width>

See Also:

User Manual - Section 8.3, Plot Mode
How To Change Plot Attributes
Command:

plot: auto_scale <toggle>

Purpose:

Turns auto scaling on or off for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

With auto scaling ON, the x and y min/max and the # of tick marks will be rounded based on user supplied attributes.

Example Usage:

plot: select_begin
plot: select_end
plot: auto_scale ON

See Also:

Associated plot commands
plot: axis_linewidth

Command:

plot: axis_linewidth <width>

Purpose:

Sets the axis line width of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>specifies the width in pixels and can be any value from 1 to 4</td>
</tr>
</tbody>
</table>

Example Usage:

plot: select_begin
1
plot: select_end
plot: axis_linewidth 2

See Also:

Associated plot commands
Command:

```
plot: axis_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the RGB color value of the axis for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
plot: select_begin
1
plot: select_end
#
# Set the plot axis to blue
#
plot: axis_rgb 0 0 1
```

See Also:

Associated `plot` commands
plot: axis_swap_minmax

Command:

plot: axis_swap_minmax <axis>

Purpose:

Swaps the axis min and max values for the specified axis of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>must be either x or y</td>
</tr>
</tbody>
</table>

Notes:

By default the values increase along the axis.

Example Usage:

plot: select_begin
1
plot: select_end
plot: axis_swap_minmax x

See Also:

Associated plot commands
Command:

```
plot: axis_x_gridtype <grid_type>
plot: axis_y_gridtype <grid_type>
```

Purpose:

Specifies the type of grid that will be drawn for the x/y axis of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>grid_type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none specifies no grid lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>grid specifies solid grid lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tick specifies tick marks only</td>
</tr>
</tbody>
</table>

Notes:

The default grid type is tick.

Example Usage:

```
plot: select_begin
plot: axis_x_gridtype tick
plot: axis_y_gridtype grid
```

See Also:

Associated plot commands
plot: axis_x/y_labelformat

Command:

\begin{verbatim}
plot: axis_x_labelformat <format> 
plot: axis_y_labelformat <format>
\end{verbatim}

Purpose:
Sets the format to be used for x/y axis value labels in the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>format</td>
<td>may be any valid C language print format string</td>
</tr>
</tbody>
</table>

Example Usage:

\begin{verbatim}
plot: select_begin
1
plot: select_end
plot: axis_x_labelformat %.2e
plot: axis_y_labelformat %.3e
\end{verbatim}

See Also:
Associated plot commands
Command:

```plaintext
plot: axis_x_labelrgb <red_val> <grn_val> <blu_val>
plot: axis_y_labelrgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the RGB color value of the x/y axis label for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0.</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
plot: select_begin
1
plot: select_end
plot: axis_x_labelrgb 0 0 1
plot: axis_y_labelrgb 1 0 0
```

See Also:

Associated plot commands
**plot: axis_x/y_labelsize**

**Command:**

```
plot: axis_x_labelsize <size>
plot: axis_y_labelsize <size>
```

**Purpose:**

Sets the size of the x/y axis label text in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>label text size; can be any value from 1 to 100.0, with a value of one specifying the smallest text and 100 the largest.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: axis_x_labelsize 10
plot: axis_y_labelsize 10
```

**See Also:**

Associated plot commands
**Command:**

```
plot: axis_x_labeltype <label_type>
plot: axis_y_labeltype <label_type>
```

**Purpose:**

Specifies how the x/y axis is labeled in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>label_type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none : no labels are drawn along axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all : a label is drawn for each tick along axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>beg_end : a label is drawn at the begin and end of axis</td>
</tr>
</tbody>
</table>

**Notes:**

The default value for x/y axis label type is `all`.

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: axis_x_labeltype none
plot: axis_x_labeltype beg_end
```

**See Also:**

Associated plot commands
**plot: axis_x/y_max**

**Command:**

```
plot: axis_x_max <max>
plot: axis_y_max <max>
```

**Purpose:**

Sets the maximum value for the x/y axis labels in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>max</td>
<td>max label number on the axis; can be any valid floating-point value</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: axis_x_max 9.5
plot: axis_y_max 5.3
```

**See Also:**

Associated **plot** commands
Command:

plot: axis_x_min <min>
plot: axis_y_min <min>

Purpose:

Sets the minimum value for the x/y axis labels in the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min</td>
<td>min label number on the axis; can be any valid floating-point value</td>
</tr>
</tbody>
</table>

Example Usage:

plot: select_begin
1
plot: select_end
plot: axis_x_min 1.5
plot: axis_y_min 1.5

See Also:

Associated plot commands
**plot: axis_x/y_numgrid**

**Command:**

```
plot: axis_x_numgrid <num>
plot: axis_y_numgrid <num>
```

**Purpose:**

Sets the number of grid lines to be used along the x/y axis of the currently selected plot(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of grid lines along the axis; can be any whole number</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
    1
plot: select_end
plot: axis_x_numgrid 10
plot: axis_y_numgrid 6
```

**See Also:**

Associated plot commands
Command:

```
plot: axis_x_numsubgrid <num>
plot: axis_y_numsubgrid <num>
```

Purpose:
Sets the number of subgrid lines to be used along the x/y axis of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>number of subgrid lines (or ticks) to be used between grid lines along an axis; can be any whole number</td>
</tr>
</tbody>
</table>

Notes:
While the argument to this command is a floating-point value, the actual number of grid lines drawn will be truncated to an integer.

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: axis_x_numsubgrid 2
plot: axis_y_numsubgrid 1
```

See Also:
Associated plot commands
plot: axis_x/y_origin

Command:

```plaintext
plot: axis_x_origin <origin>
plot: axis_y_origin <origin>
```

Purpose:

Sets the value of the x/y axis origin for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>origin</td>
<td>x or y location of origin within the plotter; range is the normalized values 0.0 to 1.0</td>
</tr>
</tbody>
</table>

Notes:

The default x/y axis origin is 0.

Example Usage:

```plaintext
plot: select_begin
1
plot: select_end
plot: axis_x_origin 0.25
plot: axis_y_origin 0.18
```

See Also:

Associated plot commands
Command:

```
plot: axis_x_scale <scale_type>
plot: axis_y_scale <scale_type>
```

Purpose:

Selects the type of scale used for the x/y axis of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>scale_type</td>
<td>one of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>linear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>logarithmic</td>
</tr>
</tbody>
</table>

Notes:

The default scale is linear.

Example Usage:

```
plot: select_begin
  1
plot: select_end
plot: axis_x_scale logarithmic
plot: axis_y_scale linear
```

See Also:

Associated plot commands
plot: axis_x/y_sgridtype

Command:

plot: axis_x_sgridtype <grid_type>
plot: axis_y_sgridtype <grid_type>

Purpose:

Specifies the type of subgrid that will be drawn for the x/y axis of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>grid_type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none specifies no grid lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>grid specifies solid grid lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tick specifies tick marks only</td>
</tr>
</tbody>
</table>

Notes:

The default subgrid type is none.

Example Usage:

plot: select_begin
1
plot: select_end
plot: axis_x_sgridtype tick
plot: axis_y_sgridtype grid

See Also:

Associated plot commands
Command:

- `plot: axis_x_title <title>`
- `plot: axis_y_title <title>`

Purpose:

Sets the title string for the x/y axis of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>title</td>
<td>x/y axis title</td>
</tr>
</tbody>
</table>

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: axis_x_title Time in Seconds
plot: axis_y_title Pressure
```

See Also:

Associated `plot` commands
**plot: axis_x/y_titlergb**

**Command:**

```
plot: axis_x_titlergb <red_val> <grn_val> <blu_val>
plot: axis_y_titlergb <red_val> <grn_val> <blu_val>
```

**Purpose:**

Specifies the RGB color value of the x/y axis title for the currently selected plot(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: axis_x_titlergb 0 0 1
plot: axis_y_titlergb 0 1 0
```

**See Also:**

Associated plot commands
**Command:**

```plaintext
plot: axis_x_titlesize <size>
plot: axis_y_titlesize <size>
```

**Purpose:**

Sets the size of the x/y axis title in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>axis title text size; can be any value from 1 to 100.0, with a value of one specifying the smallest text and 100 the largest.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
plot: select_begin
  1
plot: select_end
plot: axis_x_titlesize 10
plot: axis_y_titlesize 12
```

**See Also:**

Associated `plot` commands
plot: axis_x/y_visible

Command:

plot: axis_x_visible <toggle>
plot: axis_y_visible <toggle>

Purpose:

Controls the visibility of the x/y axis of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Plot axes are visible by default.

Example Usage:

plot: select_begin
plot: select_end
plot: axis_x_visible OFF
plot: axis_y_visible ON

See Also:

Associated plot commands
**Command:**

`plot: background_rgb <red_val> <grn_val> <blu_val>`

**Purpose:**

Specifies the background RGB color value for the currently selected plot(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Used only if `plot: background_type` is set to solid.

**Example Usage:**

```plaintext
plot: select_begin
  1
plot: select_end
plot: background_rgb 0 0 1
```

**See Also:**

Associated `plot` commands
plot: background_type

Command:

plot: background_type <type>

Purpose:

Specifies the background type of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none plot background is transparent, allowing things under it to be seen</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid plot background is opaque</td>
</tr>
</tbody>
</table>

Notes:

The default for plot background type is none.

Example Usage:

plot: select_begin
1
plot: select_end
plot: background_type solid

See Also:

Associated plot commands
plot: border_rgb

Command:

```
plot: border_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the border RGB color value for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

*Used only if plot: border_visible is set to ON.*

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: border_rgb 0 0 1
```

See Also:

Associated plot commands
plot: border_visible

Command:

    plot: border_visible <toggle>

Purpose:

    Controls the visibility of the border of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

    Plot borders are visible by default.

    The border will be drawn according to plot: border_rgb

Example Usage:

    plot: select_begin
    1
    plot: select_end
    plot: border_visible ON

See Also:

    Associated plot commands
Command:

plot: delete_plot

Purpose:

Deletes the currently selected plot(s).

Parameters:

none

Example Usage:

plot: select_begin
1 2 3
plot: select_end
plot: delete_plot

See Also:

Associated plot commands
**plot: grid_linetype**

**Command:**

```
plot: grid_linetype <line_type>
```

**Purpose:**

Specifies the type of grid lines that will be drawn for the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>line_type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dash</td>
</tr>
</tbody>
</table>

**Notes:**

The grid line_type is solid by default.

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: grid_linetype solid
```

**See Also:**

Associated plot commands
Command:

```
plot: grid_linewidth <width>
```

Purpose:

Sets the grid line width of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>specifies the line width in pixels of the grid lines, and can be any value from 1 to 4</td>
</tr>
</tbody>
</table>

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: grid_linewidth 2
```

See Also:

Associated plot commands
plot: grid_rgb

Command:

    plot: grid_rgb <red_val> <grn_val> <blu_val>

Purpose:

    Specifies the RGB color value of the grid for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

    plot: select_begin
    1
    plot: select_end
    plot: grid_rgb 0 0 1

See Also:

    Associated plot commands
Command:

```
plot: height <height>
```

Purpose:

Sets the height of the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>height</td>
<td>height of plot viewport in normalized coordinates, namely any value between 0 and 1.0, with a value of one corresponding to the height of the graphics window</td>
</tr>
</tbody>
</table>

Notes:

Plots are drawn in reference to the graphics window. A value of 1.0 is the height of the window.

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: width 0.5
plot: height 0.4
```

See Also:

Associated `plot` commands
plot: legend_rgb

Command:

    plot: legend_rgb <red_val> <grn_val> <blu_val>

Purpose:

Specifies the RGB color value of the legend for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Used only if `plot: legend_visible` is ON.

Example Usage:

    plot: select_begin
    1
    plot: select_end
    plot: legend_rgb 0 0 1

See Also:

Associated `plot` commands
**Command:**

```
plot: legend_textsize <size>
```

**Purpose:**

Sets the size of legend text in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>size of legend text; any value from 1 to 100.0, with a value of one specifying the smallest text and 100 the largest</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: legend_textsize 10
```

**See Also:**

Associated `plot` commands
**plot: legend_visible**

**Command:**

```
plot: legend_visible <toggle>
```

**Purpose:**

Controls the visibility of the legend for the currently selected plot(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

Plot legends are visible by default.

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: legend_visible OFF
```

**See Also:**

Associated plot commands
Command:

plot: origin_x <coord>
plot: origin_y <coord>

Purpose:

Specifies the x/y coordinate of the origin of the selected plot in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>coord</td>
<td>normalized coordinate of lower left corner of the plot viewport. A value of 0.0 indicates the left/botton side of the window, while a value of 1.0 indicates the right/top side.</td>
</tr>
</tbody>
</table>

Notes:

The origin of the plot will be positioned at this point (x,y) in the graphics window.

Example Usage:

plot: select_begin
1
plot: select_end
plot: origin_x 0.5
plot: origin_y 0.5

See Also:

Associated plot commands
plot: plot_title

Command:

        plot: plot_title <title>

Purpose:

        Sets the title string for the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>title</td>
<td>plot title</td>
</tr>
</tbody>
</table>

Example Usage:

        plot: select_begin
           1
        plot: select_end
        plot: plot_title My Plot Title

See Also:

        Associated plot commands
Command:

`plot: select_all`

Purpose:

Selects all of the plots in the graphics window as the target for future `plot:` commands.

Parameters:

none

Example Usage:

```
plot: select_all
plot: delete_plot
```

See Also:

Associated `plot` commands
plot: select_begin/end

Command:

\[
\text{plot: select_begin} \\
<\text{index1 index2 \ldots indexN}> \\
\text{plot: select_end}
\]

Purpose:

Selects one or more plots in the graphics window as the target for future plot: commands.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>indexN</td>
<td>plot number (zero based). Up to 10 numbers per line are allowed, but as many lines as needed can be used</td>
</tr>
</tbody>
</table>

Example Usage:

\[
\text{plot: select_begin} \\
1 2 \\
\text{plot: select_end} \\
\text{plot: delete_plot}
\]

See Also:

Associated plot commands
Command:

    plot: select_default

Purpose:

Causes any following `plot:` commands to affect the default settings, rather than a particular plot.

Parameters:

none

Notes:

All `plot:` commands following `plot: select_default` will affect default settings until a new plot is selected using `plot: select_begin/select_end`.

Example Usage:

    plot: select_default
    plot: visible OFF
    plot: select_begin
    1
    plot: select_end

See Also:

Associated `plot` commands
plot: subgrid_linetype

Command:

plot: subgrid_linetype <line_type>

Purpose:

Specifies the type of subgrid lines that will be drawn for the currently selected plot.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>line_type</td>
<td>Can be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dash</td>
</tr>
</tbody>
</table>

Notes:

The subgrid line_type is solid by default

Example Usage:

plot: select_begin
1
plot: select_end
plot: subgrid_linetype solid

See Also:

Associated plot commands
plot: subgrid_linewidth

Command:

```
plot: subgrid_linewidth <width>
```

Purpose:

Sets the subgrid line width of the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>the line width in pixels for subgrid lines (or tics); can be any value from 1 to 4</td>
</tr>
</tbody>
</table>

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: subgrid_linewidth 2
```

See Also:

Associated `plot` commands
**plot: subgrid_rgb**

**Command:**

```
plot: subgrid_rgb <red_val> <grn_val> <blu_val>
```

**Purpose:**

Specifies the RGB color value of the subgrid for the currently selected plot(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: subgrid_rgb 0 0 1
```

**See Also:**

Associated plot commands
Command:

```
plot: title_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the RGB color value of the title for the currently selected plot(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, must be between 0.0 and 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
plot: select_begin
1
plot: select_end
plot: title_rgb 0 0 1
```

See Also:

Associated plot commands
**plot: title_textsize**

**Command:**

```
plot: title_textsize <size>
```

**Purpose:**

Sets the size of title text in the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>size of title text; any value from 1 to 100.0, with a value of one specifying the smallest text and 100 the largest</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: title_textsize 10
```

**See Also:**

Associated `plot` commands
Command:

plot: visible <toggle>

Purpose:

Controls the visibility of the selected plot(s) in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Plots are visible by default.

Example Usage:

plot: select_begin
1
plot: select_end
plot: visible OFF

See Also:

Associated plot commands
**plot: width**

**Command:**

```
plot: width <width>
```

**Purpose:**

Sets the width of the currently selected plot.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>width</td>
<td>width of plot viewport in normalized coordinates, namely any value between 0 and 1.0, with a value of 1.0 corresponding to the width of the graphics window</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
plot: select_begin
1
plot: select_end
plot: width 0.5
plot: height 0.4
```

**See Also:**

Associated `plot` commands
Commands in this Section:

prefs

prefs: auto_legend_display <toggle>
prefs: auto_legend_replace <toggle>
prefs: auto_load_parts <method>
prefs: cull_lines <toggle>
prefs: default_data_directory <directory_name>
prefs: default_palette <predefined_palette_name>
prefs: fastdisplay_point_res <value>
prefs: fastdisplay_sparse_res <value>
prefs: frame_mode_allowed <toggle>
prefs: function_editor_type <interface_type>
prefs: icon_help_labels <toggle>
prefs: large_parts_list <toggle>
prefs: legend_colorby <option>
prefs: macro_panel <toggle>
prefs: new_data_notification <type>
prefs: part_panel <toggle>
prefs: resetlegend_ontimechange <toggle>
prefs: starting_time_step <value>
prefs: static_fast_display <toggle>
prefs: tool_tips <toggle>
prefs: transparency_resort <toggle>
prefs: use_continuous_perelem <toggle>
prefs: user_defined_input <toggle>
prefs: user_input_rotatesens <value>
prefs: user_input_rotateusing <rotate_mode>
prefs: user_input_zoomsens <value>
prefs: user_input_zoomusing <mode>
prefs: view_mode_allowed <toggle>

See Also:

User Manual - Section 6.2, Edit Menu Functions
User Manual - Chapter 10, Preference File Formats
How To Set or Modify Preferences
How To Customize Icon Bars
How To Customize Mouse Button Actions
How To Save GUI Settings
How To Define and Use Macros
How To Enable User Defined Input Devices
Command:

prefs: auto_legend_display <toggle>

Purpose:

Will cause the legend to automatically appear when you color a part by a variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

prefs: auto_legend_replace ON

See Also:

Associated prefs commands
Command:

`prefs: auto_legend_replace <toggle>`

Purpose:

Preference that will cause legends to be automatically replaced when the current legend is no longer in use (i.e. no parts are colored by the variable) and a new variable is in use.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

`prefs: auto_legend_replace ON`

See Also:

Associated `prefs` commands
prefs: auto_load_parts

Command:

prefs: auto_load_parts <method>

Purpose:

Allows you to have EnSight automatically load parts when the data file is read.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>Must be one of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all all parts defined in the file</td>
</tr>
<tr>
<td></td>
<td></td>
<td>first the first part defined in the file</td>
</tr>
<tr>
<td></td>
<td></td>
<td>last the last part defined in the file</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none no parts will be read</td>
</tr>
</tbody>
</table>

Example Usage:

prefs: starting_time_step last
prefs: auto_load_parts all
data: binary_files_are big_endian
data: format case
data: path /usr/tmp
data: geometry car_crash.case
data: read

See Also:

Associated prefs commands
Command:

```
prefs: cull_lines <toggle>
```

Purpose:

Will only draw shared lines between polygons once. May help performance.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: cull_lines ON
```

See Also:

Associated `prefs` commands
Command:

```
prefs: default_data_directory <directory_name>
```

Purpose:

Preference to set the default directory where the user's data resides.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>directory_name</td>
<td>name of the default directory</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: default_data_directory /usr/local/bin/ensight76/data/ami
```

See Also:

Associated `prefs` commands
**Command:**

`prefs: default_palette <predefined_palette_name>`

**Purpose:**

Preference to override the default EnSight color palette with a user predefined palette.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>predefined_palette_name</td>
<td>palette name</td>
</tr>
</tbody>
</table>

**Notes:**

When EnSight starts, it looks for user defined function color palettes located under `$CEI_HOME/ensight76/site_preferences/palettes` and in the `.ensight7/palettes` directory found in the user's home directory. These files must be named `palette_name.cpal`, where the `palette_name` will be the name of the color palette in the Simple Interface area of the function dialog.

**Example Usage:**

`prefs: default_palette FASTDefaultPalette`

**See Also:**

Associated `prefs` commands
Command:

```
prefs: fastdisplay_point_res <value>
```

Purpose:

Allows specification of fraction of nodes to display in fast display-point representation. The default is 1 (indicating all nodes), 2 (would be every other node), 3 (every third node), etc.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>value</td>
<td>&gt;= 1</td>
</tr>
</tbody>
</table>

Notes:

May help performance.

Example Usage:

```
view: fast_display ON
prefs: static_fast_display ON
prefs: fastdisplay_point_res 2
part: select_begin
1 3 4
part: select_end
part: modify_begin
part: bounding_rep points
part: modify_end
```

See Also:

Associated `prefs` commands
Command:

```
prefs: fastdisplay_sparse_res <value>
```

Purpose:

Allows specification of the percentage of the model geometry that will be displayed. The default is 50. The range is 1-100 where 1 would be sparse and 100 would be full.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>value</td>
<td>(1-100)</td>
</tr>
</tbody>
</table>

Notes:

Will help performance but will degrade quality in the graphics window while interactively transforming the model.

Example Usage:

```
view: fast_display ON
prefs: static_fast_display ON
prefs: fastdisplay_sparse_res 75
part: select_begin
  1 3 4
part: select_end
part: modify_begin
part: bounding_rep sparse_model
part: modify_end
```

See Also:

Associated `prefs` commands
prefs: frame_mode_allowed

Command:

prefs: frame_mode_allowed <toggle>

Purpose:

Will display Frame as one of the modes along the left side of the EnSight main interface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

As EnSight reads in model Parts, they are all initially assigned to the same Frame of reference: Frame 0. Frame 0 corresponds to the model coordinate system (defined when the model was created). Using the Frame mode, you can create additional frames, reassign parts to different frames, and specify various attributes of the frames. By default frame mode is not available because frame mode is an advanced feature not normally used by first time users.

Example Usage:

prefs: frame_mode_allowed ON

See Also:

Associated prefs commands
Command:

```
prefs: function_editor_type <interface_type>
```

Purpose:
Preference to set the default type of interface used for editing in the variable function editor.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>interface_type</td>
<td>must be one of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>simple</td>
</tr>
<tr>
<td></td>
<td></td>
<td>advanced</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: function_editor simple
```

See Also:

Associated `prefs` commands
Command:

`prefs: icon_help_labels <toggle>`

Purpose:
Will cause a help label to appear below the mode icons along the left side of the main EnSight interface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

`prefs: icon_help_labels ON`

See Also:

Associated `prefs` commands
Command:

```
prefs: large_parts_list <toggle>
```

Purpose:

Will cause a separate, larger parts list dialog (which can be expanded) to be used in place of the normal parts list.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: large_parts_list ON
```

See Also:

Associated `prefs` commands
prefs: legend_colorby

Command:

\texttt{prefs: legend\_colorby <option>}

Purpose:

Specifies whether color palettes will be RGB or textures.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>RGB</td>
</tr>
<tr>
<td></td>
<td></td>
<td>color using rgb values</td>
</tr>
<tr>
<td></td>
<td>textures</td>
<td>color using textures</td>
</tr>
</tbody>
</table>

Example Usage:

\texttt{prefs: legend\_colorby textures}

See Also:

Associated prefs commands
Command:

prefs: macro_panel <toggle>

Purpose:

Toggles on/off the user defined macro panel. This is normally used with VR devices and user defined input. The macro panel will be displayed in the main graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Users define the macro panel layout and actions in the ~/.ensight7/macros/hum.define file. An example hum.define file is located at $CEI_HOME/ensight76/site_preferences/macros/hum.define on your client system.

Example Usage:

prefs: macro_panel ON

See Also:

Associated prefs commands
Command:

`prefs: new_data_notification <type>`

Purpose:

Tells client how to handle dynamic data updates.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>auto_update cause the client to automatically load new data as it becomes available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ignore cause the client to not update to the new data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prompt cause a dialog box to appear asking the user what to do as new data becomes available.</td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with the dynamic data interface

Example Usage:

`prefs: new_data_notification auto_update`

See Also:

Associated `prefs` commands
Command:

`prefs: part_panel <toggle>`

Purpose:

Toggles on/off the part panel which allows users to select parts to operate on. Normally used with VR devices and user defined input when the main part list is not visible (ie. Full screen graphics window). The part panel will be displayed in the main graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

`prefs: part_panel ON`

See Also:

Associated `prefs` commands
prefs: resetlegend_ontimechange

Command:

    prefs: resetlegend_ontimechange <toggle>

Purpose:

Toggles on/off the preference of having the legend ranges update when time is changed or not.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

    prefs: resetlegend_ontimechange OFF

See Also:

Associated prefs commands
Command:

```
prefs: starting_time_step <value>
```

Purpose:
Preference to set the default starting time step for transient data. When the data is read the first or
the last step will be loaded as specified.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>value</td>
<td>must be one of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>first</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the first time step</td>
</tr>
<tr>
<td></td>
<td></td>
<td>last</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the last time step</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: starting_time_step last
data: binary_files_are big_endian
data: format case
data: path /usr/tmp
data: geometry car_crash.case
data: read
```

See Also:

Associated `prefs` commands
**prefs: static_fast_display**

**Command:**

```
prefs: static_fast_display <toggle>
```

**Purpose:**

Will cause the fast display representation to always be displayed when the fast display toggle is on. If `static_fast_display` is off (the default), fast display will only be active during a transformation.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

This is a performance enhancing attribute. This attribute can be used to work with very large models. Large models can be too slow in full element representation to manipulate (ie. transforming, positioning tools, etc.)

**Example Usage:**

```
view: fast_display ON
prefs: static_fast_display ON
part: select_begin
  1 3 4
part: select_end
part: modify_begin
part: bounding_rep points
part: modify_end
```

**See Also:**

Associated `prefs` commands
Command:

```
prefs: tool_tips <toggle>
```

Purpose:

Will cause pop-up help information to appear when the mouse is placed over certain icons while running EnSight.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
prefs: tool_tips ON
```

See Also:

Associated `prefs` commands
prefs: transparency_resort

Command:

    prefs: transparency_resort <toggle>

Purpose:

Causes polygons to be resorted with each transformation - so the image is always correct. If not on, the polygons will not be resorted while the mouse is down during transformations, but will be resorted when the mouse is released.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Increases performance, but only when interactively manipulating the model.

Example Usage:

    prefs: transparency_resort ON

See Also:

Associated prefs commands
Command:

prefs: use_continuous_perelem <toggle>

Purpose:

If on, display element variables as per node for the purpose of creating contour (filled or line) images.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

When on, the per element variable is averaged to the nodes using node count weighted algorithm.

Example Usage:

```
# set the preference to show the per element colored as a per node variable
prefs: use_continuous_perelem ON
```

See Also:

Associated prefs commands
**prefs: user_defined_input**

**Command:**

```
prefs: user_defined_input <toggle>
```

**Purpose:**

Toggles on/off the User Defined Input Device that is linked via a runtime library. This is normally used with VR devices.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

**Notes:**

Steps outlining the implementation of this library and input device are found in the file: `$CEI_HOME/ensight76/src/input/README`.

**Example Usage:**

```
prefs: user_defined_input ON
```

**See Also:**

Associated `prefs` commands
Command:

```
prefs: user_input_rotatesens <value>
```

Purpose:

Specifies a scalar value that adjusts the sensitivity of rotates when using a User Defined Input Device (i.e. values < 1 are slower, and values > 1 are faster).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>must be &gt; 0.0</td>
</tr>
</tbody>
</table>

Notes:

Steps outlining the implementation of the library for input devices are found in the file: `$CEI_HOME/ensight76/src/input/README`.

Example Usage:

```
prefs: user_defined_input ON
prefs: user_input_rotateusing Position
prefs: user_input_rotatesens 0.5
```

See Also:

Associated `prefs` commands
prefs: user_input_rotateusing

Command:

    prefs: user_input_rotateusing <rotate_mode>

Purpose:

    Allows selection of the type of rotation mode used for rotate transformations for the User Defined Input Device.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>rotate_mode</td>
<td>must be one of:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mixed_mode: A device that returns virtual angle values where the Z rotations correspond to (literal) movement of the input device about its local Z (or roll) axis; and where the X and Y rotations correspond to translational movements of the input device with respect to its local X and Y axes.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>direct_mode: A device that returns virtual angle values that correspond to (literal) rotational movements of the input device about its local X, Y, and Z axes.</td>
</tr>
</tbody>
</table>

Notes:

    Steps outlining the implementation of the library for input devices are found in the file: $CEI_HOME/ensight76/src/input/README.

Example Usage:

    prefs: user_defined_input ON
    prefs: user_input_rotateusing direct_mode

See Also:

    Associated prefs commands
Command:

```
prefs: user_input_zoomsens <value>
```

Purpose:
Specifies a value that adjusts the sensitivity of the zoom operation for the User Defined Input Device.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>must be &gt; 0.0 (&lt; 1 slower, &gt; 1 faster)</td>
</tr>
</tbody>
</table>

Notes:
Steps outlining the implementation of the library for input devices are found in the file: `$CEI_HOME/ensight76/src/input/README`.

Example Usage:
```
prefs: user_defined_input ON
prefs: user_input_zoomusing position
prefs: user_input_zoomsens 1.5
```

See Also:
Associated `prefs` commands
prefs: user_input_zoomusing

Command:

prefs: user_input_zoomusing <mode>

Purpose:

Allows selection of the mode used for zoom transformations for the User Defined Input Device.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>mode</td>
<td>must be one of:</td>
</tr>
<tr>
<td></td>
<td>valuator</td>
<td>a device that returns a value (like a virtual joystick).</td>
</tr>
<tr>
<td></td>
<td>position</td>
<td>a device that returns delta movement in the Z direction (like a wand)</td>
</tr>
</tbody>
</table>

Notes:

Steps outlining the implementation of the library for input devices are found in the file: $CEI_HOME/ensight76/src/input/README.

Example Usage:

prefs: user_defined_input ON
prefs: user_input_zoomusing position

See Also:

Associated prefs commands
Command:

```
prefs: view_mode_allowed <toggle>
```

Purpose:

Will display View as one of the modes along the left side of the EnSight main interface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

View Mode is used to adjust the appearance of Parts in the Graphics Window (Perspective, Static Color, etc.), the visibility and appearance of Labels, to adjust Auxiliary Clipping status, and to toggle visibility of the Global Axis triad. By default, this mode is not available because the attributes are available under the View menu of the main interface.

Example Usage:

```
prefs: view_mode_allowed ON
```

See Also:

Associated `prefs` commands
prefs: view_mode_allowed
Commands in this Section:

profile

profile: begin
profile: end
profile: component <x_scal> <y_scal> <z_scal>
profile: create
profile: in_plane <point>
profile: offset <value>
profile: scale_factor <value>
profile: select_default
profile: variable <name>

See Also:

User Manual - Section 7.8, Profile Create/Update
How To Create Profile Plots
profile: begin/end

Command:

```
profile: begin
<profile_commands>
profile: end
```

Purpose:

Groups profile attribute commands to be applied together before a "profile: create" command.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>profile_commands</td>
<td>any of the profile attribute commands</td>
</tr>
</tbody>
</table>

Example Usage:

```
profile: begin
profile: variable VITESSE
profile: offset 0.0000e+00
profile: scale_factor 1.3603e+00
profile: end
profile: create
```

See Also:

Associated profile commands
Command:

```
profile: component <x_scal> <y_scal> <z_scal>
```

Purpose:

Specifies the contribution of a vector variable to be applied for profile generation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scal</td>
<td>scale factor to apply to the x, y, z components of the vector</td>
</tr>
<tr>
<td></td>
<td>y_scal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_scal</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

If all the scale factors are set to 0.0, the magnitude of the vector will be used (this is the default).

Part selection and modify commands are used as needed since profiles are a part type based on a parent part.

Example Usage:

```
profile: variable VITESSE
part: select_begin
  3
part: select_end
part: modify_begin
  #
  # Use the y-component of the vector
  #
  profile: component 0.0000e+00 1.0000e+00 0.0000e+00
part: modify_end
```

See Also:

Associated `profile` commands
profile: create

Command:

    profile: create

Purpose:

Create a profile part with the currently defined attributes using the currently selected parts as parents.

Parameters:

none

Notes:

The profile part is created using the currently selected parts as parents. The profile part is created using the currently set profile attributes.

Example Usage:

    #
    # Select parent part
    #
    part: select_begin
    2
    part: select_end
    profile: begin
    profile: variable VITESSE
    profile: offset 0.0000e+00
    profile: scale_factor 1.3603e+00
    profile: end
    profile: create

See Also:

Associated profile commands
Command:

profile: in_plane <point>

Purpose:

Specify the location of the orientation points for profile generation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>point</td>
<td>must be 1, 2, or 3 (indicating which point is being specified)</td>
</tr>
</tbody>
</table>

Notes:

Three points define the plane in which the profile will be projected. The corresponding 4th point is generated and the center of these 4 points determines which direction the profile will projected in the plane.

Example Usage:

```
#  #   Select existing profile part
#
part: select_begin
  3
part: select_end
part: modify_begin
profile: in_plane 1 1.1977e+00 2.5928e+00 -9.6950e+00
profile: in_plane 2 2.0198e+01 2.5928e+00 -9.6950e+00
profile: in_plane 3 2.0198e+01 9.5655e+00 7.9793e+00
part: modify_end
```

See Also:

Associated profile commands
profile: offset

Command:

```profile: offset <value>```

Purpose:

Add a value to the variable values before scaling the profile.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>value to add to the variable values before scaling</td>
</tr>
</tbody>
</table>

Notes:

This command has the effect of shifting the profile up or down relative to the parent part(s).

Example Usage:

```#
# Select existing profile part
#
part: select_begin
  3
part: select_end
part: modify_begin
profile: offset 1.0000e+00
profile: scale_factor 2.0000e+00
part: modify_end```

See Also:

Associated profile commands
**Command:**
```
profile: scale_factor <value>
```

**Purpose:**
Apply a scale factor to the variable values of the profile.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>scale factor to apply to the variable values</td>
</tr>
</tbody>
</table>

**Example Usage:**
```
# Select existing profile part
#
part: select_begin
  3
part: select_end
part: modify_begin
profile: offset 3.0000e+00
profile: scale_factor 1.5000e+01
part: modify_end
```

**See Also:**
Associated `profile` commands
**Command:**

```
profile: select_default
```

**Purpose:**

Sets the current profile to none, so that subsequent commands will modify the default profile attributes.

**Parameters:**

```
none
```

**Notes:**

When profiles are created, the default attributes are used (unless overridden by attribute commands between "profile: begin / end" commands. This command allows for changing of defaults.

**Example Usage:**

```
profile: select_default
profile: offset 0.0000e+00
profile: scale_factor 1.0000e+00
```

**See Also:**

Associated `profile` commands
Command:

\textit{profile: variable <name>}

Purpose:

Sets the variable to use for profile creation or modification.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>variable name</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Select existing profile part
#
part: select_begin
2
part: select_end
profile: begin
profile: variable VITESSE
profile: end
profile: create
```

See Also:

Associated \textit{profile} commands
profile: variable
Commands in this Section:

ptrace

ptrace: add_file <filename>
ptrace: add_net <num_in_x> <num_in_y>
ptrace: add_part <part_num>
ptrace: add_partbyname <part_name>
ptrace: add_pt
ptrace: add_rake <num_points>
ptrace: add_surface_net <num_in_x> <num_in_y> <x1> <y1> <x2> <y2>
ptrace: add_surface_pt <screen_x> <screen_y>
ptrace: add_surface_rake <num_points> <x1> <y1> <x2> <y2>
ptrace: animate <toggle>
ptrace: begin
ptrace: end
ptrace: component <x_scal> <y_scal> <z_scal>
ptrace: create_file <filename>
ptrace: create_net <num_in_x> <num_in_y>
ptrace: create_part <part_num>
ptrace: create_partbyname <part_name>
ptrace: create_pt
ptrace: create_rake <num_points>
ptrace: create_surface_net <num_in_x> <num_in_y> <x1> <y1> <x2> <y2>
ptrace: create_surface_pt <screen_x> <screen_y>
ptrace: create_surface_rake <num_points> <x1> <y1> <x2> <y2>
ptrace: default_emit_net <num_in_x> <num_in_y>
ptrace: default_emit_part <part_num>
ptrace: default_emit_partbyname <part_name>
ptrace: default_emit_pt
ptrace: default_emit_rake <num>
ptrace: delete_emitter
ptrace: delta_time <emit_delta>
ptrace: display_offset <offset_distance>
ptrace: emit_at_current_time <toggle>
ptrace: emit_density <value>
ptrace: emit_number <value>
ptrace: massed_drag <toggle>
ptrace: massed_drag_coefficient <table_name>
ptrace: massed_fluid_density <density>
ptrace: massed_fluid_viscosity <viscosity>
ptrace: massed_gravity <toggle>
ptrace: massed_gravity_vector <gx> <gy> <gz>
ptrace: massed_initial_use_fluid <toggle>
ptrace: massed_initial_velocity <vx> <vy> <vz>
ptrace: massed_particles <toggle>
ptrace: massed_particle_density <density>
ptrace: massed_particle_diameter <diameter>
ptrace: massed_pressure <toggle>
ptrace: massed_pressure_gradient <variable_name>
ptrace: max_angle <value>
ptrace: min_angle <value>
ptrace

ptrace: min_steps <num>
ptrace: modify_emit_totoolloc <part_num> <emitter>
ptrace: modify_fileemit_name <emitter> <filename>
ptrace: modify_netemit_points <emitter> <new_num_in_x> <new_num_in_y>
ptrace: modify_partemit_byname <emitter> <new_part_name>
ptrace: modify_partemit_num <emitter> <new_part_num>
ptrace: modify_rakeemit_points <emitter> <new_num_pts>
ptrace: representation <rep>
ptrace: ribbon_width <width>
ptrace: rot_angle <value>
ptrace: select_default
ptrace: select_emitter_begin
ptrace: select_emitter_end
ptrace: start_time <emit_time>
ptrace: surface_restricted <toggle>
ptrace: total_time <limit>
ptrace: trace_direction <direction>
ptrace: type <option>
ptrace: variable <name>
ptrace: variable_offset <offset_distance>

See Also:

User Manual - Section 7.4, Particle Trace Create/Update
How To Create Particle Traces
Command:

ptrace: add_file <filename>

Purpose:

Adds emitters (and thus more traces) to the current particle trace part(s) according to the time and locations as defined in the file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>The name of the emitter file</td>
</tr>
</tbody>
</table>

Example Usage:

```bash
# Add emitters to a currently defined particle trace part 3
#
part: select_begin
  3
part: select_end
ptrace: add_file /tmp/emitter.file
```

See Also:

EnSight Particle Emitter File Format

Associated ptrace commands
ptrace: add_net

Command:

ptrace: add_net <num_in_x> <num_in_y>

Purpose:

Add emitters (and thus more traces) to the current particle trace part(s) from

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_in_x</td>
<td>number of equally spaced points in the x direction of the plane tool</td>
</tr>
<tr>
<td>int</td>
<td>num_in_y</td>
<td>number of equally spaced points in the y direction of the plane tool</td>
</tr>
</tbody>
</table>

Notes:

Any existing particle trace parts can have emitters added to them. These trace parts must be selected, and the plane tool must be at the new position, before the addition. The number of additional emitter points will be the product of $num_in_x \times num_in_y$.

Example Usage:

```plaintext
# Getting the plane tool to the desired location
#
view_transf: plane 1 1.750000 2.700000 0.000000
view_transf: plane 2 13.000000 2.700000 0.000000
view_transf: plane 3 13.000000 9.500000 0.000000
#
# Selecting the parent part(s)
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating 35 traces from the plane tool (becomes part 2)
#
ptrace: create_net 5 7
#
# Moving the plane tool to a new location
#
tools: plane ON
view_transf: function plane
view_transf: scale -0.522802 -1.195307 1.000000
view_transf: translate -10.588167 -0.218373 0.000000
view_transf: function global
#
# Selecting the particle trace part to add to
# and adding the 9 new emitters from which
# more traces are made
#
part: select_begin
  2
part: select_end
ptrace: add_net 3 3

See Also:

Associated ptrace commands
ptrace: add_part

Command:

```plaintext
ptrace: add_part <part_num>
```

Purpose:

Add emitters (and thus more traces) to the current particle trace part(s) from the nodes of additional parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_num</td>
<td>number of the part whose nodes will be used as an emitter</td>
</tr>
</tbody>
</table>

Notes:

Any existing particle trace parts can have emitters added to them. These trace parts must be selected before the addition. The number of additional emitter points will be the number of nodes in the part multiplied by the "ptrace: emit_density" value.

Example Usage:

```plaintext
# Selecting the parent part(s)
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
# ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: emit_density 1.0000e+00
ptrace: end
#
# Creating traces from all the nodes of part 2 (becomes part 7)
# ptrace: create_part 2
#
# Selecting the particle trace part to add to
# and adding the new emitters from all the nodes
# of part 3, form which more traces are made
# part: select_begin
  7
part: select_end
ptrace: add_part 3
```

See Also:

Associated ptrace commands
ptrace: add_partbyname

Command:

ptrace: add_partbyname <part_name>

Purpose:

Add emitters (and thus more traces) to the current particle trace part(s) from the nodes of additional parts. (Used instead of "ptrace: add_part" if doing parts by name)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>part_name</td>
<td>name of the part whose nodes will be used as an emitter</td>
</tr>
</tbody>
</table>

Notes:

Any existing particle trace parts can have emitters added to them. These trace parts must be selected before the addition. The number of additional emitter points will be the number of nodes in the part multiplied by the "ptrace: emit_density" value.

Example Usage:

```
# Selecting the particle trace part
part: select_partname_begin
"(CASE:Case 1)Particle trace part"
part: select_partname_end

# Creating traces from all the nodes
# of a clip line part
#
ptrace: add_partbyname (CASE:Case 1)Clip_line
```

See Also:

Associated ptrace commands
ptrace: add_pt

Command:

ptrace: add_pt

Purpose:

Adds emitters (and thus more traces) to the current particle trace part(s) from the current location of the cursor (a point).

Parameters:

none

Notes:

Any existing particle trace part can have emitters added to them. These trace parts must be selected, and the cursor must be at the new location, before the addition.

Example Usage:

```
# # Getting the cursor to the desired location
# view_transf: cursor -0.927830 1.474020 0.000000
# # Selecting the parent part(s)
# part: select_begin
1
# part: select_end
# # Setting some attributes before creation
# # (others are the current defaults)
# # ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
# # Creating trace from a point (becomes part 2)
# ptrace: create_pt
# # Moving the cursor to a new location
# tools: cursor ON
view_transf: function cursor
view_transf: translate -7.368053 -0.491341 0.000000
view_transf: function global
# # Selecting the particle trace part to add to
# and adding the new emitter from which another
# trace is made
# part: select_begin
2
# part: select_end
ptrace: add_pt
```
See Also:

Associated `ptrace` commands
ptrace: add_rake

Command:

ptrace: add_rake <num_points>

Purpose:

Add emitters (and thus more traces) to the current particle trace part(s) from the current line tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_points</td>
<td>number of equally spaced points on the line to use as emitters</td>
</tr>
</tbody>
</table>

Notes:

Any existing particle trace part can have emitters added to them. These trace parts must be selected, and the line tool must be at the new position, before the addition.

Example Usage:

```plaintext
# Getting the line tool to the desired location
#
view_transf: line 1 9.000000 6.000000 0.000000
view_transf: line 2 30.000000 6.000000 0.000000
#
# Selecting the parent part(s)
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating 10 traces from a line tool (becomes part 2)
#
ptrace: create_rake 10
#
# Moving the line tool to a new location
#
tools: line ON
view_transf: function line
view_transf: translate -4.202520 4.531246 0.000000
view_transf: function global
#
# Selecting the particle trace part to add to
# and adding the 6 new emitters from which more
# traces are made
#
part: select_begin
  2
```
part: select_end
ptrace: add_rake 6

See Also:

Associated ptrace commands
ptrace: add_surface_net

Command:

```
ptrace: add_surface_net <num_in_x> <num_in_y> <x1> <y1> <x2> <y2>
```

Purpose:

Add emitters (and thus more traces) to the current particle trace part(s) from the grid of a screen box pick.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_in_x</td>
<td>number of equally spaced points in the x direction of the plane tool</td>
</tr>
<tr>
<td></td>
<td>num_in_y</td>
<td>number of equally spaced points in the y direction of the plane tool</td>
</tr>
<tr>
<td>float</td>
<td>x1</td>
<td>screen x coordinate of the first point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y1</td>
<td>screen y coordinate of the first point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>screen x coordinate of the second point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>screen y coordinate of the second point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

Notes:

The "ptrace: surface_restricted" command must be ON prior to this command.

Any existing particle trace parts can have emitters added to them. These trace parts must be selected before the addition.

The number of additional emitter points will be the product of num_in_x * num_in_y.

Example Usage:

```
# Selecting the parent part(s)
part: select_begin
  1
part: select_end
# Setting some attributes before creation
# (surface_restricted must be on)
# ptrace: begin
ptrace: begin
ptrace: surface_restricted ON
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
# Creating 35 surface restricted traces from
# the box selection (becomes part 2)
# ptrace: create_surface_net 5 7
```


# Selecting the surface restricted particle trace
# part to add to, and adding the 16 new emitters
# from which more traces are made
#
part: select_begin
  2
part: select_end
ptrace: create_surface_net 4 4 0.114734 0.424963 0.166667 0.362556

See Also:

Associated ptrace commands
ptrace: add_surface_pt

Command:

    ptrace: add_surface_pt <screen_x> <screen_y>

Purpose:

Adds emitters (and thus more traces) to the current surface restricted particle trace part(s) from a screen point pick location.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>screen_x</td>
<td>screen x coordinate (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>screen_y</td>
<td>screen y coordinate (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

Notes:

The "ptrace: surface_restricted" command must be ON prior to this command. Any existing surface restricted particle trace part can have emitters added to them. These trace parts must be selected before the addition.

Example Usage:

```plaintext
# # Getting the cursor to the desired location
# view_transf: cursor -0.927830 1.474020 0.000000
# # Selecting the parent part(s)
# part: select_begin
1
part: select_end
# # Setting some attributes before creation # (surface_restricted must be on)
# # ptrace: begin
ptrace: begin
ptrace: surface_restricted ON
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
# # Creating surface restricted trace from a # screen location (becomes part 2)
# # ptrace: create_surface_pt 0.148551 0.484398
# # Selecting the particle trace part to add to # and adding a couple of new emitters from which # more traces are made
# # part: select_begin
part: select_begin
2
part: select_end
ptrace: add_surface_pt 0.136473 0.646360
ptrace: add_surface_pt 0.193237 0.546805
```
See Also:

Associated `ptrace` commands
ptrace: add_surface_rake

**Command:**

    ptrace: add_surface_rake <num_points> <x1> <y1> <x2> <y2>

**Purpose:**

Add emitters (and thus more traces) to the current surface restricted particle trace part(s) from a screen pick rake location.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_points</td>
<td>number of equally spaced points on the line to use as emitters</td>
</tr>
<tr>
<td>float</td>
<td>x1</td>
<td>screen x coordinate of the first end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y1</td>
<td>screen y coordinate of the first end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>screen x coordinate of the second end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>screen y coordinate of the second end of the rake (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

**Notes:**

The "ptrace: surface_restricted" command must be ON prior to this command. Any existing particle trace parts can have emitters added to them. These trace parts must be selected before the addition.

**Example Usage:**

```plaintext
#
#
# Getting the line tool to the desired location
#
view_transf: line 1 9.000000 6.000000 0.000000
view_transf: line 2 30.000000 6.000000 0.000000
#
# Selecting the parent part(s)
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (surface_restricted must be on)
#
ptrace: begin
ptrace: surface_restricted ON
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating 10 surface restricted traces from
# a rake pick location (becomes part 2)
#
ptrace: create_surface_rake 10 0.117150 0.540862 0.117150 0.442793
#
# Selecting the particle trace part to add to
# and adding 6 new emitters from which more
ptrace: add_surface_rake

# traces are made
#
part: select_begin
 2
part: select_end
ptrace: add_surface_rake 6 0.129227 0.594354 0.188406 0.592868

See Also:

Associated ptrace commands
ptrace: animate

Command:

ptrace: animate <toggle>

Purpose:

Toggles particle trace animation on or off for selected traces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```
# # Selecting the trace(s) to animate
# part: select_begin
  7 8
part: select_end
# # Turning on the animation for the two selected trace parts
# part: modify_begin
  ptrace: animate ON
part: modify_end
```

See Also:

Associated `ptrace` commands
ptrace: begin

Command:

```plaintext
ptrace: begin
<ptrace_command>
<ptrace_command>
.
.
<ptrace_command>
ptrace: end
```

Purpose:

Delimit the modifications for particle trace attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>ptrace_command</td>
<td>any of the various attribute changing &quot;ptrace:&quot; commands</td>
</tr>
</tbody>
</table>

Notes:

These commands are used to set the attributes for particle trace part creation.

Example Usage:

```
#
# Selecting the parent part
#
pard: select_begin
  1
parr: select_end
#
# Setting some attributes before creation
#
ptrace: begin
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated ptrace commands
ptrace: component

Command:

```
ptrace: component <x_scal> <y_scal> <z_scal>
```

Purpose:

Specifies the contribution of the components of the flow field vector variable through which the particle trace will be integrated.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scal</td>
<td>scale factor to apply to the x, y, z components of the vector</td>
</tr>
<tr>
<td></td>
<td>y_scal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_scal</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The normal situation is to have all three set to 1.0, to get the true vector field.

Example Usage:

```plaintext
# Selecting the parent part
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (the components are being set here)
#
ptrace: begin
ptrace: type streamline
#
# Create the particle trace with
# the x and y components of the vector
#
ptrace: component 1.0000e+00 1.0000e+00 0.0000e+00
ptrace: representation line
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated `ptrace` commands
**Command:**

```
ptrace: create_file <filename>
```

**Purpose:**

Create particle traces from the current location of the line tool.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>The name of the emitter file</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
# Create particle traces through part 1 by releasing
# emitters as defined in the given file
#
part: select_begin
  1
part: select_end
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: create_file /tmp/emitter.file
```

**See Also:**

- EnSight Particle Emitter File Format
- Associated `ptrace` commands
ptrace: create_net

Command:

ptrace: create_net <num_in_x> <num_in_y>

Purpose:

Create particle traces from the plane tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_in_x</td>
<td>number of equally spaced points in the x direction of the plane tool</td>
</tr>
<tr>
<td></td>
<td>num_in_y</td>
<td>number of equally spaced points in the y direction of the plane tool</td>
</tr>
</tbody>
</table>

Notes:

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation.

A parent part or parts (containing the flow field) must be selected prior to this command. You need the plane tool to be at the desired location.

The number of emitter points will be the product of num_in_x * num_in_y.

Example Usage:

```
# Getting the plane tool to the desired location
view_transf: plane 1 1.750000 2.700000 0.000000
view_transf: plane 2 13.000000 2.700000 0.000000
view_transf: plane 3 13.000000 9.500000 0.000000
#
# Selecting the parent part(s)
#
part: select_begin
  1 3 4
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating 35 traces from the plane tool
#
ptrace: create_net 5 7
```

See Also:

Associated ptrace commands
Command:

ptrace: create_part <part_num>

Purpose:

Create particle traces from the nodes of a part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_num</td>
<td>number of the part whose nodes will be used as an emitter</td>
</tr>
</tbody>
</table>

Notes:

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command. The number of emitter points will be the number of nodes in the part multiplied by the "ptrace: emit_density" value.

Example Usage:

```
# # Selecting the parent part(s)
# part: select_begin
  1 3 4
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
# ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: emit_density 1.0000e+00
ptrace: end
#
# Creating traces from all the nodes of part 2
# ptrace: create_part 2
```

See Also:

Associated ptrace commands
**ptrace: create_partbyname**

**Command:**

```
ptrace: create_partbyname <part_name>
```

**Purpose:**

Create a particle trace from the nodes of a part, where the part is referred to by name.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>part_name</td>
<td>name of the part whose nodes will be used as an emitter</td>
</tr>
</tbody>
</table>

**Notes:**

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command. The number of emitter points will be the number of nodes in the part multiplied by the "ptrace: emit_density" value.

**Example Usage:**

```
# # Selecting the parent part(s)
# part: select_begin
  1 3 4
part: select_end
# # Setting some attributes before creation
# (others are the current defaults)
# ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: emit_density 1.0000e+00
ptrace: end
#
# Creating traces from all the nodes of the part
# entitled "(CASE:Case 1)Clip_line"
# ptrace: create_partbyname (CASE:Case 1)Clip_line
```

**See Also:**

Associated `ptrace` commands
Command:

ptrace: create_pt

Purpose:

Create a particle trace from the current location of the cursor (a point).

Parameters:

none

Notes:

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command, and you need the cursor to be at the desired location.

Example Usage:

```
# Getting the cursor to the desired location
view_transf: cursor -0.927830 1.474020 0.00000
#
# Selecting the parent part(s)
#
part: select_begin
  1 3 4
part: select_end
#
# Setting some attributes before creation
# (others are the current defaults)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated ptrace commands
ptrace: create_rake

Command:

ptrace: create_rake <num_points>

Purpose:

Create particle traces from the current location of the line tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_points</td>
<td>number of equally spaced points on the line to use as emitters</td>
</tr>
</tbody>
</table>

Notes:

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command, and you need the line tool to be at the desired location.

Example Usage:

```
# # Getting the line tool to the desired location
#
view_transf: line 1 9.000000 6.000000 0.000000
view_transf: line 2 30.000000 6.000000 0.000000
#
# # Selecting the parent part(s)
#
part: select_begin
  1 3 4
part: select_end
#
# # Setting some attributes before creation
# (others are the current defaults)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# # Creating 10 traces from a line tool
#
ptrace: create_rake 10
```

See Also:

Associated ptrace commands
**Command:**

```plaintext
ptrace: create_surface_net <num_in_x> <num_in_y> <x1> <y1> <x2> <y2>
```

**Purpose:**

Create surface restricted particle traces from a screen box pick.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_in_x</td>
<td>number of equally spaced points in the x direction of the box pick</td>
</tr>
<tr>
<td></td>
<td>num_in_y</td>
<td>number of equally spaced points in the y direction of the box pick</td>
</tr>
<tr>
<td>float</td>
<td>x1</td>
<td>screen x coordinate of the first point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y1</td>
<td>screen y coordinate of the first point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>screen x coordinate of the second point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>screen y coordinate of the second point on the diagonal of the box (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

**Notes:**

The "ptrace: surface_restricted" command must be **ON** prior to this command.

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command. The number of emitter points will be the product of `num_in_x * num_in_y`.

**Example Usage:**

```plaintext
part: select_begin
    1 3 4
part: select_end
    # Setting some attributes before creation
    # (surface_restricted must be on)
    #
    ptrace: begin
    ptrace: surface_restricted ON
    ptrace: variable VITESSE
    ptrace: type streamline
    ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
    ptrace: representation line
    ptrace: emit_at_current_time ON
    ptrace: end
    #
    # Creating 35 traces from the box selection
    #
    ptrace: create_surface_net 5 7
```

**See Also:**

Associated `ptrace` commands
ptrace: create_surface_pt

Command:

\[
\text{ptrace: create_surface_pt <screen_x> <screen_y>}
\]

Purpose:

Create a surface restricted particle trace from a screen point pick location.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>screen_x</td>
<td>screen x coordinate (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>screen_y</td>
<td>screen y coordinate (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

Notes:

The "ptrace: surface_restricted" command must be ON prior to this command.

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command.

Example Usage:

```plaintext
# Selecting the parent part(s)
part: select_begin
  1 3 4
part: select_end

# Setting some attributes before creation
# (surface_restricted must be on)
#
ptrace: begin
ptrace: surface_restricted ON
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end

# Creating surface restricted trace from a screen location
#
ptrace: create_surface_pt 0.148551 0.484398
```

See Also:

Associated ptrace commands
ptrace: create_surface_rake

Command:

ptrace: create_surface_rake <num_points> <x1> <y1> <x2> <y2>

Purpose:

Create surface restricted particle traces from a screen pick rake location.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_points</td>
<td>number of equally spaced points along the rake to use as emitters</td>
</tr>
<tr>
<td>float</td>
<td>x1</td>
<td>screen x coordinate of the first end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y1</td>
<td>screen y coordinate of the first end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>x2</td>
<td>screen x coordinate of the second end of the rake (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>y2</td>
<td>screen y coordinate of the second end of the rake (0.0 to 1.0)</td>
</tr>
</tbody>
</table>

Notes:

The "ptrace: surface_restricted" command must be on prior to this command.

The default attributes and/or any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end" commands are used for the trace creation. A parent part or parts (containing the flow field) must be selected prior to this command.

Example Usage:

```
# # Selecting the parent part(s)
#
part: select_begin
  1 3 4
part: select_end
#
# Setting some attributes before creation
# (surface_restricted must be on)
#
ptrace: begin
ptrace: surface_restricted ON
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating 10 traces from a screen rake location
#
ptrace: create_surface_rake 10 0.117150 0.540862 0.117150 0.442793
```

See Also:

Associated ptrace commands
ptrace: default_emit_file

**Command:**

`ptrace: default_emit_file <filename>`

**Purpose:**

Set the default filename for file emitters and sets the user interface Emit From option to be File.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>The default emitter file name</td>
</tr>
</tbody>
</table>

**Example Usage:**

```bash
# Set the default file emitter
ptrace: default_emit_file /tmp/emitter.file
```

**See Also:**

- [EnSight Particle Emitter File Format](#)
- Associated `ptrace` commands
ptrace: default_emit_net

Command:

    ptrace: default_emit_net <num_in_x> <num_in_y>

Purpose:

Set the default number of x and y grid points for net emitters, and sets the user interface Emit From option to be Plane.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num_in_x</td>
<td>number of emission points to be the default for x direction of net</td>
</tr>
<tr>
<td></td>
<td>num_in_y</td>
<td>number of emission points to be the default for y direction of net</td>
</tr>
</tbody>
</table>

Notes:

Mainly used to set the default "Emit From" option in the user interface, but also sets the default number of x and y grid points. Any subsequent particle traces created using a net will use this unless changed specifically.

Example Usage:

    #
    # Set the default number of emission points
    # for nets to be 10 x 12 in this case
    #
    ptrace: default_emit_net 10 12

See Also:

Associated ptrace commands
ptrace: default_emit_part

Command:

```
ptrace: default_emit_part <part_num>
```

Purpose:

Set the default part number for part emitters, and sets the user interface `Emit From` option to be Part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_num</td>
<td>default part number to use for part emitters</td>
</tr>
</tbody>
</table>

Notes:

Mainly used to set the default "Emit From" in the user interface, but also set the default part number. Any subsequent particle traces created using a part emitter will use this unless changed specifically. This command does not apply if doing parts by name instead of number. (Use "ptrace: default_emit_partbyname" if doing parts by name).

Example Usage:

```
# Set the default part number for part emitters
# (int this case, setting to part 5)
# ptrace: default_emit_part 5
```

See Also:

Associated ptrace commands
ptrace: default_emit_partbyname

Command:

ptrace: default_emit_partbyname <part_name>

Purpose:

Set the default part name for part emitters, and sets the user interface Emit From option to be Part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_name</td>
<td>the default part name to use for part emitters</td>
</tr>
</tbody>
</table>

Notes:

Mainly used to set the default "Emit From" in the user interface, but also sets the default part name. Any subsequent particle traces created using a part emitter will use this unless changed specifically. This command does not apply if doing parts by number instead of name. (Use "ptrace: default_emit_part" if doing parts by number).

Example Usage:

```
# Set the default part name for part emitters
# (int this case, setting to a particular clip line part)
#
ptrace: default_emit_partbyname (CASE:Case 1)Clip_line
```

See Also:

Associated ptrace commands
ptrace: default_emit_pt

Command:

ptrace: default_emit_pt

Purpose:

Set the user interface Emit From option to be Cursor.

Parameters:

none

Notes:

Sets the default "Emit From" in the user interface.

Example Usage:

ptrace: default_emit_pt

See Also:

Associated ptrace commands
Command:

    ptrace: default_emit_rake <num>

Purpose:

Set the default number of emission points for rake emitters, and sets the user interface Emit From option to be Line.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>the number of emission points to be the default for rakes</td>
</tr>
</tbody>
</table>

Notes:

Mainly used to set the default "Emit From" option in the user interface, but also sets the default number of rake emission points. Any subsequent particle traces created using a rake will use this unless changed specifically.

Example Usage:

```
# Set the default number of emission points for rakes to be 10 in this case
#
ptrace: default_emit_rake 10
```

See Also:

Associated `ptrace` commands
ptrace: delete_emitter

Command:

ptrace: delete_emitter

Purpose:

Remove emitters from a particle trace part (and their associated traces).

Parameters:

none

Notes:

The desired emitter for the particle trace part must be selected before this command is issued.

Example Usage:

```
# # Selecting the parent part(s)
# part: select_begin
  2
part: select_end
# # Selecting the emitter within the part
# # (in this case we will delete the first 3 emitters)
# ptrace: select_emitter_begin
  0 1 2
ptrace: select_emitter_end
ptrace: delete_emitter
```

See Also:

Associated ptrace commands
Command:

`ptrace: delta_time <emit_delta>`

Purpose:

Specifies the time interval between emissions from the emitters.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>emit_delta</td>
<td>the time interval between emissions. (The default is 0.0, which will cause only the initial emission to take place.</td>
</tr>
</tbody>
</table>

Notes:

Particles will be traced starting at the current time step or the time specified with `ptrace: start_time`. Additional particles will be released every “`emit_delta`” time units.

Most useful for pathline generation.

Example Usage:

```plaintext
# # Selecting the parent part
# part: select_begin
# 1
part: select_end
#
# Setting some attributes before creation
# (the delta_time is being set here, to emit # every 2.5 time units)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: start_time 1.5000e+01
ptrace: delta_time 2.5000e+00
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated `ptrace` commands
ptrace: display_offset

Command:

```plaintext
ptrace: display_offset <offset_distance>
```

Purpose:

Sets the distance normal to the surface at which the surface restricted trace will be displayed. This can be used to avoid z-buffer display problems that arise because the trace lies in the same plane as the surface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset_distance</td>
<td>the distance normal to the surface at which to display the trace</td>
</tr>
</tbody>
</table>

Notes:

A positive number moves the trace in the direction of the positive surface normal, while a negative number moves in the opposite direction.

Example Usage:

```plaintext
# # Selecting the parent part
# part: select_begin
1 part: select_end
# # Setting some attributes before creation
# # (the display_offset for the surface restricted trace # is being set here)
# ptrace: begin
part: description Particle trace part
ptrace: surface_restricted ON
ptrace: variable_offset 1.0000e-01
ptrace: display_offset -0.5000e+00
ptrace: total_time 2.0000e+02
ptrace: emit_at_current_time ON
ptrace: end
# # Creating trace from a point
# ptrace: create_pt
```

See Also:

Associated ptrace commands
Command:

`ptrace: emit_at_current_time <toggle>`

Purpose:

Sets the emission time for a particle trace to be current time when the particle trace is created. The particle trace is also updated whenever time is changed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> to emit and update at the current time</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> to emit at the set <code>start_time</code> and not update when time is changed</td>
</tr>
</tbody>
</table>

Notes:

While this flag is ON, the "`ptrace: start_time" is not used.

Example Usage:

```#
# Selecting the parent part
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (the emit_at_current_time flag is being set here)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated `ptrace` commands
ptrace: emit_density

Command:

    ptrace: emit_density <value>

Purpose:

    Allows for particle trace emissions from a random subset of the nodes in an emitter part instead of all from all nodes.

    *(Note: this command has been superceded by ptrace: emit_number)*

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>A number between 0.0 and 1.0. A value of 1.0 will cause all nodes to emit, 0.5 will cause a random half of the nodes to emit, etc.</td>
</tr>
</tbody>
</table>

Example Usage:

    #
    # Selecting the parent part
    #
    part: select_begin
    1
    part: select_end
    #
    # Setting some attributes before creation
    # (the emit_density value is being set here)
    #
    ptrace: begin
    ptrace: variable VITESSE
    ptrace: type streamline
    ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
    ptrace: representation line
    ptrace: emit_at_current_time ON
    ptrace: emit_density 5.0000e-01
    ptrace: end
    #
    # Creating trace with the nodes from part 2 as emitters
    # (due to the emit_density command above, only half the nodes will emit)
    #
    ptrace: create_part 2

See Also:

    Associated ptrace commands
ptrace: emit_number

Command:

ptrace: emit_number <value>

Purpose:

Specify the number of emissions from a random subset of nodes in an emitter part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>value</td>
<td>The number of emission points to use</td>
</tr>
</tbody>
</table>

Notes:

The nodes of the emitter part are used. The maximum number of emitter locations that can be created is limited by the number of nodes in the emitter part.

Example Usage:

```plaintext
# Create particle traces through part 1 by releasing
# 25 emitters off of part 2
#
p: select_begin
1
p: select_end
p: begin
p: variable VITESSE
p: type streamline
p: emit_number 25
p: create_part 2
```

See Also:

Associated ptrace commands
ptrace: massed_drag

Command:

ptrace: massed_drag <toggle>

Purpose:

Specify whether the drag force term is used in the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: use drag as part of the forces on the particle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: do not use drag as part of the forces on the particle</td>
</tr>
</tbody>
</table>

Notes:

The default setting is ON. The “ptrace: massed_particles” command does not have to be ON in order to specify this command. Drag force term in the massed-particle momentum balance equation is computed according to the ptrace: massed_pressure_gradient setting.

Example Usage:

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Toggle on massed-particle drag force term
# Specify default drag coefficient function table
#
part: modify_begin
ptrace: massed_drag ON
ptrace: massed_drag_coefficient none
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated ptrace commands
Command:

ptrace: massed_drag_coefficient <table_name>

Purpose:

Specify the name of the drag coefficient function table to be used in the drag force term of the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>table_name</td>
<td>none defaults to hard coded DragCoefTable1</td>
</tr>
<tr>
<td></td>
<td>DragCoefTable1</td>
<td>drag coefficient computed by table</td>
</tr>
<tr>
<td></td>
<td>DragCoefPower</td>
<td>drag coefficient computed by power function</td>
</tr>
<tr>
<td></td>
<td>DragCoefPoly</td>
<td>drag coefficient computed by polynomial function</td>
</tr>
<tr>
<td></td>
<td>any User-Defined Math Function</td>
<td>drag coefficient computed by a user supplied function</td>
</tr>
</tbody>
</table>

Notes:

The default setting is "none". The "ptrace: massed_particles" command does not have to be ON in order to specify this command. This parameter is only used when the drag force term "ptrace: massed_drag" is toggled ON.

Also the three options "DragCoefPoly", "DragCoefPower", and "DragCoefTable1", are EnSight User-Defined Math Functions. These math functions are typically located under $CEI_HOME/ensight76/src/math_functions, and are compiled as libraries by the user, and then dynamically liked via the ENSIGHT7_UDMF environment variable.

Example Usage:

```
# Create a massless point trace
# part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Toggle on massed-particle drag force term
# Specify default drag coefficient function table
# part: modify_begin
ptrace: massed_drag ON
ptrace: massed_drag_coefficient none
part: modify_end
#
# Change part to massed trace using current settings
# part: modify_begin
ptrace: massed_particles ON
```
ptrace: massed_drag_coefficient

part: modify_end
#
# Change the drag coefficient function to use the power formulation
#
part: modify_begin
ptrace: massed_drag_coefficient DragCoefPower
part: modify_end

See Also:

ptrace: massed_drag <toggle>

Associated ptrace commands
ptrace: massed_fluid_density

**Command:**

```
ptrace: massed_fluid_density <density>
```

**Purpose:**

Specify the density of the corresponding fluid field where the massed-particles are traced.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>density</td>
<td>the fluid density constant value of the corresponding fluid field</td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>string</td>
<td>density</td>
<td>the fluid density variable name of the corresponding fluid field - defaults to &quot;none&quot; when constant value used</td>
</tr>
</tbody>
</table>

**Notes:**

The default setting for this parameter is the constant value of "1.0", with the Fluid Density variable name set to "none". This indicates that no variable name is used; rather the constant density is used in the calculations instead. The "ptrace: massed_particles" command does not have to be ON in order to specify this command. This parameter is figured only when the drag and gravity force terms of the massed-particle momentum balance equation are used.

**Example Usage:**

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Specify density scalar field variable name of the fluid.
#
part: modify_begin
ptrace: massed_fluid_density density
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

**See Also:**

Associated `ptrace` commands
ptrace: massed_fluid_viscosity

Command:

ptrace: massed_fluid_viscosity <viscosity>

Purpose:

Specify the dynamic viscosity of the corresponding fluid field where the massed-particles are traced.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>viscosity</td>
<td>the dynamic viscosity constant value of the corresponding fluid field</td>
</tr>
<tr>
<td>or</td>
<td>viscosity</td>
<td></td>
</tr>
<tr>
<td>string</td>
<td>viscosity</td>
<td>the dynamic viscosity variable name of the corresponding fluid field -</td>
</tr>
<tr>
<td></td>
<td></td>
<td>defaults to &quot;none&quot; when constant value used</td>
</tr>
</tbody>
</table>

Notes:

The default setting for this parameter is the constant value of “1.9620e+05”, with the Fluid Dynamic Viscosity variable name set to "none". This indicates that no variable name is used; rather the constant dynamic viscosity is used in the calculations instead. The "ptrace: massed_particles" command does not have to be ON in order to specify this command. This parameter is figured only when the drag force term of the massed-particle momentum balance equation is used.

Example Usage:

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Specify dynamic viscosity scalar field variable name of the fluid.  
#
part: modify_begin
ptrace: massed_fluid_viscosity dynamic_viscosity
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

ptrace: massed_drag <toggle>

Associated ptrace commands
Command:

```plaintext
ptrace: massed_gravity <toggle>
```

Purpose:

Specify whether the gravity force term is used in the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td><strong>ON</strong> use gravity as part of the forces on the particle</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OFF</strong> do not use gravity as part of the forces on the particle</td>
</tr>
</tbody>
</table>

Notes:

The default setting is **ON**. The "ptrace: massed_particles" command does not have to be **ON** in order to specify this command. If this command is **ON**, then the gravity force term in the massed-particle momentum balance equation is computed according to the "ptrace: massed_gravity_vector" setting.

Example Usage:

```plaintext
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Toggle on massed-particle gravity force term
# Specify gravity vector
#
part: modify_begin
ptrace: massed_gravity ON
ptrace: massed_gravity_vector 0.00000e+00-9.81000e+00 0.00000e+00
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated `ptrace` commands
ptrace: massed_gravity_vector

Command:

```plaintext
ptrace: massed_gravity_vector <gx> <gy> <gz>
```

Purpose:

Specify the name of the gravity vector used in the pressure force term of the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>gx</td>
<td>the x-component of the gravity vector</td>
</tr>
<tr>
<td></td>
<td>gy</td>
<td>the y-component of the gravity vector</td>
</tr>
<tr>
<td></td>
<td>gz</td>
<td>the z-component of the gravity vector</td>
</tr>
</tbody>
</table>

Notes:

The default setting is <0., -9.81, 0.>. The “ptrace: massed_particles” command does not have to be ON in order to specify this command.

Example Usage:

```plaintext
# Create a massless point trace
#
p: select_all
ptrace: select_default
p: modify_begin
ptrace: variable velocity
p: modify_end
p: select_all
ptrace: create_pt
p: select_begin
  2
p: select_end
#
# Toggle on massed-particle gravity force term
# Specify the gravity vector
#
p: modify_begin
ptrace: massed_gravity ON
ptrace: massed_gravity_vector 0.00000e+00-9.81000e+00 0.00000e+00
p: modify_end
#
# Change part to massed trace using current settings
#
p: modify_begin
ptrace: massed_particles ON
p: modify_end
```

See Also:

- ptrace: massed_gravity <toggle>

Associated ptrace commands
ptrace: massed_initial_use_fluid

Command:

ptrace: massed_initial_use_fluid <toggle>

Purpose:

Specify whether to use the velocity of the fluid at the particle emitter location as the initial velocity of the massed-particle.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON  use the fluid velocity at the start of each trace</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF use the specified velocity at the start of each trace</td>
</tr>
</tbody>
</table>

Notes:

The default value is ON. The "ptrace: massed_particles" command does not have to be ON in order to specify this command. This parameter is figured in all terms of the massed-particle momentum balance equation. If the value of this command is OFF, then the massed-particle emitter will use the velocity specified via the "ptrace: massed_initial_velocity" command.

Example Usage:

```
# Create a massless point trace
# part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Do not use the field velocity as the initial particle velocity
# Specify the initial velocity value for all the massed-particles
#
part: modify_begin
ptrace: massed_initial_use_fluid OFF
ptrace: massed_initial_velocity 1.0000e+00 1.0000e+00 1.0000e+00
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: massed_initial_velocity

Command:

```plaintext
ptrace: massed_initial_velocity <vx> <vy> <vz>
```

Purpose:

Specify the initial emitter velocity vector to be used on all the massed-particles.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>vx</td>
<td>the x-component of the initial velocity vector</td>
</tr>
<tr>
<td></td>
<td>vy</td>
<td>the y-component of the initial velocity vector</td>
</tr>
<tr>
<td></td>
<td>vz</td>
<td>the z-component of the initial velocity vector</td>
</tr>
</tbody>
</table>

Notes:

The default vector value is <1,1,1>. The “ptrace: massed_particles” command does not have to be ON in order to specify this command. This parameter is figured in all terms of the massed-particle momentum balance equation. The values of this command take effect only if “ptrace: massed_initial_use_fluid” is toggled OFF.

Example Usage:

```plaintext
# Create a massless point trace
# part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
# Do not use the field velocity as the initial particle velocity
# Specify the initial velocity value for all the massed-particles
# part: modify_begin
ptrace: massed_initial_use_fluid OFF
ptrace: massed_initial_velocity 1.0000e+00 1.0000e+00 1.0000e+00
part: modify_end
# Change part to massed trace using current settings
# part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: massed_particles

Command:

`ptrace: massed_particles <toggle>`

Purpose:

Enable or disable massed-particle trace calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON  turn on massed force terms</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF do not use massed force terms</td>
</tr>
</tbody>
</table>

Notes:

The default value is OFF. The “ptrace: massed_particles” command does not have to be ON in order to specify the other massed-particle commands.

Example Usage:

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Change part to massed trace using current settings
#
ptrace: massed_particles ON
part: modify_begin
```

See Also:

Associated `ptrace` commands
ptrace: massed_particle_density

Command:

ptrace: massed_particle_density <density>

Purpose:

Specify the density of all the massed-particles.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>density</td>
<td>the density value of all the particles</td>
</tr>
</tbody>
</table>

Notes:

The default value is 1.0e+03. The "ptrace: massed_particles" command does not have to be ON in order to specify this command. This parameter is figured in all terms of the massed-particle momentum balance equation. Water particle densities are on the order of 1.0e+3, and air particle densities are on the order of 1.0.

Example Usage:

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Specify density of all the massed particles
#
part: modify_begin
ptrace: massed_particle_density 1.0000e+03
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated `ptrace` commands
Command:

ptrace: massed_particle_diameter <diameter>

Purpose:

Specify the diameter of all the massed-particles.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>diameter</td>
<td>the diameter value of all the particles</td>
</tr>
</tbody>
</table>

Notes:

The default value is 1.0e-03. The “ptrace: massed_particles” command does not have to be ON in order to specify this command. This parameter is figured in all terms of the massed-particle momentum balance equation. Water particle diameters are on the order of 1.0e-3, and air particle diameters are on the order of 1.0e-6.

Example Usage:

```plaintext
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Specify diameter of the massed particle
#
part: modify_begin
ptrace: massed_particle_diameter 1.0000e-03
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: massed_pressure

Command:

    ptrace: massed_pressure <toggle>

Purpose:

Specify whether the pressure force term is used in the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>OFF: use pressure as part of the forces on the particle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON: do not use pressure as part of the forces on the particle</td>
</tr>
</tbody>
</table>

Notes:

The default setting is OFF. The "ptrace: massed_particles" command does not have to be ON in order to specify this command. If this command is ON, then the pressure force term in the massed-particle momentum balance equation is computed according to the "ptrace: massed_pressure_gradient" setting.

Example Usage:

```plaintext
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Toggle on massed-particle pressure force term
# Specify pressure gradient variable
#
part: modify_begin
ptrace: massed_pressure ON
ptrace: massed_pressure_gradient grad_pressure
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: massed_pressure_gradient

Command:

ptrace: massed_pressure_gradient <variable_name>

Purpose:

Specify the name of the pressure gradient variable used in the pressure force term of the massed-particle calculation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name or none</td>
<td>the name of the pressure gradient variable</td>
</tr>
</tbody>
</table>

Notes:

The "ptrace: massed_particles" command does not have to be ON in order to specify this command. If "none" is specified, then the pressure force term is ignored in the massed-particle calculation. The default setting is "none".

Example Usage:

```
# Create a massless point trace
#
part: select_all
ptrace: select_default
part: modify_begin
ptrace: variable velocity
part: modify_end
part: select_all
ptrace: create_pt
part: select_begin
  2
part: select_end
#
# Toggle on massed-particle pressure force term
# Specify pressure gradient variable
#
part: modify_begin
ptrace: massed_pressure ON
ptrace: massed_pressure_gradient grad_pressure
part: modify_end
#
# Change part to massed trace using current settings
#
part: modify_begin
ptrace: massed_particles ON
part: modify_end
```

See Also:

ptrace: massed_pressure <toggle>

Associated ptrace commands
ptrace: max_angle

Command:

ptrace: max_angle <value>

Purpose:

Sets the maximum angle between successive particle trace line segments that will trigger a halving of the integration step.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>desired maximum angle (in degrees). If the angle between successive segments is greater than this, the integration step will be halved. The range is 1.0 to 90.0 degrees</td>
</tr>
</tbody>
</table>

Notes:

When a particle trace starts curving, the integration step typically needs to be decreased. This attribute is one of the controls for such adaptation.

Example Usage:

```plaintext
# Selecting the trace(s)
# part: select_begin
  7 8
  part: select_end
# Modifying attributes for the two selected trace parts
# (max_angle is modified in here)
# part: modify_begin
  ptrace: min_steps 3
  ptrace: min_angle 3.0000e+00
  ptrace: max_angle 2.0000e+01
  ptrace: rot_angle 3.2000e+01
# Updates the traces with the modified attributes
# part: modify_end
```

See Also:

Associated ptrace commands
Command:

ptrace: min_angle <value>

Purpose:

Sets the minimum angle between successive particle trace line segments that will trigger a doubling of the integration step.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>desired minimum angle (in degrees). If the angle between successive segments is less than this, the integration step will be doubled. The range is 1.0 to 90.0 degrees</td>
</tr>
</tbody>
</table>

Notes:

When a particle trace is not curving, the integration step can typically be increased. This attribute is one of the controls for such adaptation.

Example Usage:

```plaintext
#  # Selecting the trace(s)
#  part: select_begin
  7 8
  part: select_end
#  # Modifying attributes for the two selected trace parts
#  # (min_angle is modified in here)
#  part: modify_begin
  ptrace: min_steps 3
  ptrace: min_angle 3.0000e+00
  ptrace: max_angle 2.0000e+01
  ptrace: rot_angle 3.2000e+01
#  # Updates the traces with the modified attributes
#  part: modify_end
```

See Also:

Associated ptrace commands
ptrace: min_steps

Command:

ptrace: min_steps <num>

Purpose:

Sets the minimum number of integration steps to perform in each element

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>desired minimum number of integration steps per element (range is 2 to 20)</td>
</tr>
</tbody>
</table>

Notes:

A higher number increases the accuracy of the integration, but is more compute intensive and produces more segments to display.

Example Usage:

```bash
# # Selecting the trace(s)
# part: select_begin
  7 8
part: select_end
# # Modifying attributes for the two selected trace parts
# (min_steps being modified in here)
# part: modify_begin
ptrace: min_steps 3
ptrace: min_angle 3.0000e+00
ptrace: max_angle 2.0000e+01
ptrace: rot_angle 3.2000e+01
# # Updates the traces with the modified attributes
# part: modify_end
```

See Also:

Associated ptrace commands
ptrace: modify_emit_totoolloc

Command:

ptrace: modify_emit_totoolloc <part_num> <emitter>

Purpose:

Change the location of the emitter in a particle trace part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_num</td>
<td>particle trace part number</td>
</tr>
<tr>
<td></td>
<td>emitter</td>
<td>emitter number (0-based)</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Change the location of the tool used for the emitter
# view_transf: cursor 7.422632 -0.327560 0.000000
# modify the trace emitter based on this tool
# (in this case, it is emitter 0 in part 2
# ptrace: modify_emit_totoolloc 2 0
```

See Also:

Associated ptrace commands
ptrace: modify_fileemit_name

Command:

    ptrace: modify_fileemit_name <emitter> <filename>

Purpose:

Change the emitter file name for a file emitter.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitter</td>
<td>Emitter number (0 based)</td>
</tr>
<tr>
<td>string</td>
<td>filename</td>
<td>The new emitter file name</td>
</tr>
</tbody>
</table>

Example Usage:

    # Select an existing particle trace part 3
    #
    #
    part: select_begin
    3
    part: select_end
    #
    # Change the emitter name for emitter 0
    #
    ptrace: modify_fileemit_name 0 /tmp/new_emitter.file

See Also:

EnSight Particle Emitter File Format

Associated ptrace commands
**Command:**

```
ptrace: modify_netemit_points <emitter> <new_num_in_x> <new_num_in_y>
```

**Purpose:**

Change the number of emission points for a particular net emitter in a particle trace part.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitter</td>
<td>emitter number (0-based)</td>
</tr>
<tr>
<td>int</td>
<td>new_num_in_x</td>
<td>desired new number of emission points for the grid x direction.</td>
</tr>
<tr>
<td>int</td>
<td>new_num_in_y</td>
<td>desired new number of emission points for the grid y direction.</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
# Selecting an existing particle trace part
# (which contains some net emitters)
part: select_begin
  3
part: select_end
# Changing the number of points in the
# first 2 net emitters (emitters 0 and 1)
# to 5 x 6, and 9 x 15 respectively
#
ptrace: modify_netemit_points 0 5 6
ptrace: modify_netemit_points 1 9 15
```

**See Also:**

Associated `ptrace` commands
ptrace: modify_partemit_byname

Command:

ptrace: modify_partemit_byname <emitter> <new_part_name>

Purpose:

Change the part name for a particular part emitter in a particle trace part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitter</td>
<td>the emitter number (0-based)</td>
</tr>
<tr>
<td></td>
<td>new_part_name</td>
<td>name of the new part from which emissions from nodes will be made</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Selecting an existing particle trace part
# (which contains some part emitters)
part: select_partname_begin
"(CASE:Case 1)Particle trace part"
part: select_partname_end
#
# Changing emitter 1 to use the nodes
# from clip line2 part
#
ptrace: modify_partemit_byname 1 (CASE:Case 1)Clip_line2
```

See Also:

Associated ptrace commands
**ptrace: modify_partemit_num**

**Command:**

```
ptrace: modify_partemit_num <emitter> <new_part_num>
```

**Purpose:**

Change the part number for a particular part emitter in a particle trace part.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitter</td>
<td>emitter number (0-based)</td>
</tr>
<tr>
<td></td>
<td>new_part_num</td>
<td>new part number from which emissions from nodes will be made</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
#  # Selecting an existing particle trace part
# (which contains some part emitters)
#  #
part: select_begin
  3
part: select_end
#  #
#  # Changing emitter 3 to use the nodes
#  # from part 12
#  #
ptrace: modify_partemit_num 3 12
```

**See Also:**

Associated `ptrace` commands
ptrace: modify_rakeemit_points

Command:

ptrace: modify_rakeemit_points <emitter> <new_num_pts>

Purpose:

Change the number of emission points for a particular rake emitter in a particle trace part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitter</td>
<td>emitter number (0-based)</td>
</tr>
<tr>
<td></td>
<td>new_num_pts</td>
<td>desired new number of emission points along the rake</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Selecting an existing particle trace part
# (which contains a rake emitter)
#
part: select_begin
  3
part: select_end
#
# Changing the number of points in the
# first emitter (emitter 0), to 8
#
ptrace: modify_rakeemit_points 0 8
```

See Also:

Associated ptrace commands
Command:

```
ptrace: representation <rep>
```

Purpose:

Sets the display representation for a particle trace.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>rep</td>
<td>line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the trace will be drawn as a line</td>
</tr>
<tr>
<td></td>
<td>ribbon</td>
<td>ribbon</td>
</tr>
<tr>
<td></td>
<td>square_tubes</td>
<td>the trace be drawn as a square tube</td>
</tr>
</tbody>
</table>

Notes:

Use the ribbon or square_tubes representations whenever rotational effects need to be seen. Surface restricted traces can only be displayed in line representation.

Example Usage:

```
# Selecting the trace(s)
#
part: select_begin
  ? 8
part: select_end
  #
  # Modifying attributes for the two selected trace parts
  # (representation is modified in here)
  #
  part: modify_begin
  ptrace: representation ribbon
  ptrace: ribbon_width 2.0000e+00
  #
  # Updates the traces with the modified attributes
  #
  part: modify_end
```

See Also:

Associated ptrace commands
ptrace: ribbon_width

Command:

```plaintext
ptrace: ribbon_width <width>
```

Purpose:

Sets the width for ribbon or square tube particle trace representations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>width</td>
<td>the width of the ribbon or square tube</td>
</tr>
</tbody>
</table>

Notes:

This attribute has no effect when using the "line" trace representation.

Example Usage:

```plaintext
# Selecting the trace(s)
part: select_begin
  7 8
part: select_end
# Modifying attributes for the two selected trace parts
# (ribbon_width is modified in here)
part: modify_begin
ptrace: representation square_tubes
ptrace: ribbon_width 2.0000e+00
# Updates the traces with the modified attributes
part: modify_end
```

See Also:

Associated `ptrace` commands
ptrace: rot_angle

Command:

ptrace: rot_angle <value>

Purpose:

Sets the angle between successive particle trace line segments that will trigger a halving of the integration step.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>desired rotational angle (in degrees). If the change in rotation angle is greater than this, the integration step will be halved. range is 1.0 to 90.0 degrees</td>
</tr>
</tbody>
</table>

Notes:

When a particle begins experiencing rotational effects, the integration step typically needs to be decreased. This attribute is one of the controls for such adaptation.

Example Usage:

```plaintext
# # Selecting the trace(s)
#
part: select_begin
  7 8
part: select_end
#
# Modifying attributes for the two selected trace parts
# (rot_angle is modified in here)
#
part: modify_begin
ptrace: min_steps 3
ptrace: min_angle 3.0000e+00
ptrace: max_angle 2.0000e+01
ptrace: rot_angle 3.20000e+01
#
# Updates the traces with the modified attributes
#
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: select_default

Command:

```en
tptrace: select_default
```

Purpose:

Sets the currently selected particle trace parts to none, so any following attribute modifications will change the particle trace defaults.

Parameters:

```en
none
```

Notes:

When particle trace parts are created, the defaults, and any "ptrace:" attribute commands between "ptrace: begin" and "ptrace: end", are used in the creation.

Example Usage:

```en
#
# Setting to default particle traces
#
ptrace: select_default
#
# modifying some attributes
#
part: modify_begin
ptrace: variable VITESSE
ptrace: type pathline
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: select_emitter_begin/end

Command:

```plaintext
ptrace: select_emitter_begin
<emitter0 emitter1 ... emitterN>
ptrace: select_emitter_end
```

Purpose:

Select emitters within a particle trace part for the purpose of modifying emitter attributes, deleting, etc.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>emitterN</td>
<td>emitter numbers (0-based)</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Selecting the parent part(s)
#
part: select_begin
2
part: select_end
# Selecting the first 3 emitters within the part
# for the purpose of deleting them
#
ptrace: select_emitter_begin
0 1 2
ptrace: select_emitter_end
ptrace: delete_emitter
```

See Also:

Associated `ptrace` commands
ptrace: start_time

Command:

ptrace: start_time <emit_time>

Purpose:

Specifies the solution time at which to begin particle emission.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>emit_time</td>
<td>solution time for particle emission. Must be in the range of valid solution times</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Selecting the parent part
part: select_begin
  1
part: select_end
# Setting some attributes before creation
# (the start_time is being set here)
#
ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: start_time 1.5000e+01
ptrace: delta_time 1.0000e+00
ptrace: end
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated ptrace commands
ptrace: surface_restricted

Command:

ptrace: surface_restricted <toggle>

Purpose:

Toggles trace creation to be surface restricted or not.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for surface restricted traces</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for regular traces</td>
</tr>
</tbody>
</table>

Example Usage:

#  
# Selecting the parent part  
#  
part: select_begin  
  1  
part: select_end  
#  
# Setting some attributes before creation  
# (the surface_restricted flag is being set here)  
#  
ptrace: begin  
part: description Particle trace part  
ptrace: surface_restricted ON  
ptrace: variable_offset 1.0000e-01  
ptrace: display_offset 0.50000e+00  
ptrace: total_time 2.0000e+02  
ptrace: emit_at_current_time ON  
ptrace: end  
#  
# Creating trace from a point  
#  
ptrace: create_pt

See Also:

Associated ptrace commands
ptrace: total_time

Command:

ptrace: total_time <limit>

Purpose:

Sets the maximum length of time that the particle trace is allowed to continue.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>limit</td>
<td>total time limit</td>
</tr>
</tbody>
</table>

Notes:

A particle trace may terminate earlier than this for other reasons, but this limit avoids infinite calculations in recirculation zones.

Example Usage:

```
# Selecting the trace(s)
part: select_begin
  7 8
part: select_end
#
# Modifying attributes for the two selected trace parts
# (total_time is modified in here)
part: modify_begin
ptrace: total_time 2.0000e+02
ptrace: trace_direction +/-
part: modify_end
#
# Updates the traces with the modified attributes
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: trace_direction

Command:

ptrace: trace_direction <direction>

Purpose:

Sets the integration direction for a particle trace - forward in time, backward in time, or both.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>direction</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to trace forward in time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to trace backward in time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+/-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to trace both forward and backward in time</td>
</tr>
</tbody>
</table>

Notes:

By setting this option appropriately, one can see where a particle will go if released from the emitter location (the + direction), or one can see the path that a particle took to get to the emitter location (the - direction).

Example Usage:

```bash
# # Selecting the trace(s)
#
part: select_begin
  7 8
part: select_end
#
# # Modifying attributes for the two selected trace parts
# (trace_direction is modified in here)
#
part: modify_begin
ptrace: total_time 2.0000e+02
ptrace: trace_direction +/-
#
# # Updates the traces with the modified attributes
#
part: modify_end
```

See Also:

Associated ptrace commands
ptrace: type

Command:

ptrace: type <option>

Purpose:

Sets the type of particle trace that will be created.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>streamline: trace will be integrated in the flow field at a specific time</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pathline: trace will be integrated in the changing flow field</td>
</tr>
</tbody>
</table>

Notes:

Pathline is only available for transient data cases.

Example Usage:

```
# Setting default particle trace variable
ptrace: select_default
part: modify_begin
ptrace: variable VITESSE
part: modify_end

# Selecting the parent part
part: select_begin
1
part: select_end

# Setting some attributes before creation
# (the type is being set here)
# ptrace: begin
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: end

# Creating trace from a point
ptrace: create_pt
```

See Also:

Associated ptrace commands
**ptrace: variable**

**Command:**

`ptrace: variable <name>`

**Purpose:**

Specifies the vector variable to use for the flow field for the particle trace.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>name of the vector variable</td>
</tr>
</tbody>
</table>

**Example Usage:**

```bash
# Selecting the parent part
part: select_begin
  1
part: select_end
# Setting some attributes before creation
# (the variable is being set here)
# ptrace: begin
ptrace: variable VITESSE
ptrace: type streamline
ptrace: component 1.0000e+00 1.0000e+00 1.0000e+00
ptrace: representation line
ptrace: end
# Creating trace from a point
# ptrace: create_pt
```

**See Also:**

Associated `ptrace` commands
ptrace: variable_offset

Command:

ptrace: variable_offset <offset_distance>

Purpose:

Sets the distance from the surface into the flow field at which the velocity variable will be sampled. The tangential component of the variable at this offset distance is the field that will be used to trace through for surface restricted traces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset_distance</td>
<td>distance into the field</td>
</tr>
</tbody>
</table>

Notes:

A positive number moves the distance in the direction of the positive normal of the surface, while a negative number moves in the opposite direction. If there is only flow on one side of the surface, the program will flip the sign internally.

Used only for surface restricted particle traces.

Example Usage:

```plaintext
# Selecting the parent part
#
part: select_begin
  1
part: select_end
#
# Setting some attributes before creation
# (the variable_offset for the surface_restricted trace
#  is being set here)
#
ptrace: begin
part: description Particle trace part
ptrace: surface_restricted ON
ptrace: variable_offset 1.0000e-01
ptrace: display_offset 0.50000e+00
ptrace: total_time 2.00000e+02
ptrace: emit_at_current_time ON
ptrace: end
#
# Creating trace from a point
#
ptrace: create_pt
```

See Also:

Associated ptrace commands
Commands in this section:

**query_ent_var**

- `query_ent_var: #_of_sample_pts <total_points>`
- `query_ent_var: auto_plot_checkexisting <toggle>`
- `query_ent_var: auto_plot_queries <toggle>`
- `query_ent_var: begin`
- `query_ent_var: end`
- `query_ent_var: modify_begin`
- `query_ent_var: modify_end`
- `query_ent_var: begin_simtime <time_value>`
- `query_ent_var: end_simtime <time_value>`
- `query_ent_var: constrain <option>`
- `query_ent_var: cursor_loc <x_coord> <y_coord> <z_coord>`
- `query_ent_var: description <desc>`
- `query_ent_var: distance <option>`
- `query_ent_var: elem_id <element_id_#>`
- `query_ent_var: generate_over <type>`
- `query_ent_var: ijk <i-plane_#> <j-plane_#> <k-plane_#>`
- `query_ent_var: line_loc <end_point_id> <x_comp> <y_comp> <z_comp>`
- `query_ent_var: marker_rgb <red_val> <grn_val> <blu_val>`
- `query_ent_var: marker_size_normalized <size_value>`
- `query_ent_var: marker_visible <toggle>`
- `query_ent_var: modify_begin`
- `query_ent_var: modify_end`
- `query_ent_var: multiple_segments_by <option>`
- `query_ent_var: node_id <node_id_#>`
- `query_ent_var: operation_factor1 <scale>`
- `query_ent_var: operation_factor2 <scale>`
- `query_ent_var: operation_query1byname <name>`
- `query_ent_var: operation_query2byname <name>`
- `query_ent_var: origin <x_coord> <y_coord> <z_coord>`
- `query_ent_var: part_id <part_id_#>`
- `query_ent_var: part_idbyname <part_name>`
- `query_ent_var: query`
- `query_ent_var: query_type <type>`
- `query_ent_var: sample_by <option>`
- `query_ent_var: select_all_timesteps`
- `query_ent_var: type <domain>`
- `query_ent_var: variable_1 <name>`
- `query_ent_var: variable_2 <name>`

**See Also:**

User Manual - Section 7.11, Query/Plot
How To Query/Plot
How To Change Plot Attributes
query_ent_var: #_of_samplePts

Command:

```
query_ent_var: #_of_sample_pts <total_points>
```

Purpose:

Specify the number of evenly spaced points to sample either along the line tool or over the specified range of time steps.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>total_points</td>
<td>For queries over Distance using the Line Tool, this specifies the number of equally spaced points to query along the line (default = 20). For queries Over Time, this specifies how many evenly timed moments over the specified range of time steps at which to query - if left blank, you get a sample point at each time step (default = # of time steps).</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

If you specify more or fewer sample points than the number of time steps, EnSight linearly interpolates between the adjoining time steps.

If the query is an FFT sampling, the number of frequencies output will be (a power of two) less than or equal to the number of sample points.

Example Usage:

```
#  # Creation example...
#  
part: select_begin
1
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: line_loc 1 2.7770e-01 7.7363e-02 1.1348e-02
query_ent_var: line_loc 2 7.6144e-01 1.7007e-01 5.5697e-02
query_ent_var: variable Density
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
#  # Modification example...
#  
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
```
See Also:

Associated `query_ent_var` commands
query_ent_var: auto_plot_checkexisting

Command:

query_ent_var: auto_plot_checkexisting <toggle>

Purpose:

Specifies to check for existing plotters with the same abscissa when auto plotting query information.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: assign the query to any existing plotter with same abscissa</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: assign to a new plotter</td>
</tr>
</tbody>
</table>

Notes:

Only applicable with the "query_ent_var: auto_plot_queries ON" command.

Example Usage:

query_ent_var: auto_plot_checkexisting ON

See Also:

Associated query_ent_var commands
Command:

```
query_ent_var: auto_plot_queries <toggle>
```

Purpose:

Specify that any created query to be plotted automatically.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

See also the “query_ent_var: auto_plot_checkexisting” command.

Example Usage:

```
query_ent_var: auto_plot_queries ON
```

See Also:

Associated `query_ent_var` commands
query_ent_var: begin/end

Command:

    query_ent_var: begin
    query_ent_var: end

Purpose:

Delimit the modifications for query attributes.

Parameters:

  None.

Notes:

  These commands are used to set the attributes for a query creation.

Example Usage:

    part: select_begin
1  
    part: select_end
    query_ent_var: begin
    query_ent_var: description
    query_ent_var: type distance
    query_ent_var: #_of_sample_pts 20
    query_ent_var: constrain line_tool
    query_ent_var: line_loc 1 2.7770e-01 7.7363e-02 1.1348e-02
    query_ent_var: line_loc 2 7.6144e-01 1.7007e-01 5.5697e-02
    query_ent_var: variable Density
    query_ent_var: end
    query_ent_var: query
    curve: select_begin
0  
    curve: select_end

See Also:

  Associated query_ent_var commands
**Command:**

```
query_ent_var: begin_simtime <time_value>
```

**Purpose:**

Specify the beginning simulation time to start the query over time.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>beginning simulation time value (that corresponds to a valid time step)</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type time" command.

**Example Usage:**

```bash
#
# Select part
#
part: select_begin
2
part: select_end
#
# Query over time
#
query_ent_var: begin
query_ent_var: description
query_ent_var: type time
query_ent_var: #_of_sample_pts 84
query_ent_var: begin_simtime 2.2300e+02
query_ent_var: end_simtime 4.8800e+02
query_ent_var: constrain node
query_ent_var: sample_by value
query_ent_var: node_id 1
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
#
# Select resulting plot curve
#
curve: select_begin
0
curve: select_end
```

**See Also:**

Associated `query_ent_var` commands
query_ent_var: constrain

Command:

query_ent_var: constrain <option>

Purpose:

Specify the manner in which to constrain the query of the variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>query type Over Time choices are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cursor to query the variable (or FFTs) at the point specified by the cursor tool. (This option is dependent on the &quot;query_ent_var: cursor_loc&quot; command.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>element to query the variable (or FFTs) at the element specified by the Element Id. (This option is dependent on the &quot;query_ent_var: elem_id&quot; command.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ijk to query the variable values (or FFTs) at a specified IJK node (only applicable if the selected part is structured). (This option is dependent on the &quot;query_ent_var: ijk&quot; command.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max to query for the maximum variable at each time step</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min to query for the minimum variable at each time step</td>
</tr>
<tr>
<td></td>
<td></td>
<td>node to query the variable (or FFTs) at the node specified by the Node Id. (This option is dependent on the &quot;query_ent_var: node_id&quot; command.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>query type Distance choices are:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1d_part query the variable values at the ends of the bar elements of a Part. (This option is dependent on the &quot;query_ent_var: part_id&quot; command.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>line_tool query the variable values at evenly spaced steps of the Line Tool</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

```plaintext
# Modification change:
# query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: modify_end
```
See Also:

Associated `query_ent_var` commands
query_ent_var: cursor_loc

Command:

```
query_ent_var: cursor_loc <x_coord> <y_coord> <z_coord>
```

Purpose:

Specify the x,y,z coordinates of the cursor location to be queried.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>specify the x, y, z coordinate locations of the cursor in model space</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Used in conjunction with the "query_ent_var: type time" and the "query_ent_var: constrain cursor" commands.

Example Usage:

```
# Specify part on which to perform query
#
part: select_begin
2
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type time
query_ent_var: #_of_sample_pts 84
query_ent_var: begin_simtime
query_ent_var: end_simtime
query_ent_var: constrain cursor
query_ent_var: sample_by value
query_ent_var: cursor_loc 1.4870e+00 4.3663e-01 1.1934e+01
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
#
# Specify new curve to be current
#
curve: select_begin
1
curve: select_begin
```

See Also:

Associated `query_ent_var` commands
Command:

```
query_ent_var: description <desc>
```

Purpose:

Specify the text description for the query entity.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>desc</td>
<td>text description for the query entity</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between a "query_ent_var: begin" and "query_ent_var: end" pair.

Example Usage:

```
part: select_begin
  2
part: select_end
query_ent_var: begin
query_ent_var: description Temp Vs. Time
query_ent_var: type time
query_ent_var: #_of_sample_pts 10
query_ent_var: begin_simtime 2.2300e+02
query_ent_var: end_simtime 4.8800e+02
query_ent_var: constrain cursor
query_ent_var: sample_by value
query_ent_var: cursor_loc 1.4870e+00 4.3663e-01 1.1934e+01
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
curve: select_begin
  2
curve: select_end
```

See Also:

Associated `query_ent_var` commands
**query_ent_var: distance**

**Command:**

```
query_ent_var: distance <option>
```

**Purpose:**

Specify how to parameterize the distance of the computed query (also, how the Distance is labeled on the plot).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option arc_length</td>
<td>(default) measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of the line segments in the range 0 to the arc length</td>
</tr>
<tr>
<td></td>
<td>x_arc_length</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of the x, y, or z components of the line segments in the range 0 to sum of the x, y, or z components of the arc length</td>
</tr>
<tr>
<td></td>
<td>y_arc_length</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of the x, y, or z components of the line segments in the range 0 to sum of the x, y, or z components of the arc length</td>
</tr>
<tr>
<td></td>
<td>z_arc_length</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of just the x, y, or z components of the line segments in the range determined by the position vector of the starting endpoint to the position vector of its final endpoint</td>
</tr>
<tr>
<td></td>
<td>from_origin</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of the line segments in the range determined by the position vector of the starting endpoint to the position vector of its final endpoint</td>
</tr>
<tr>
<td></td>
<td>x_from_origin</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of just the x, y, or z components of the line segments in the range determined by the position vector of the starting endpoint to the position vector of its final endpoint</td>
</tr>
<tr>
<td></td>
<td>y_from_origin</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of just the x, y, or z components of the line segments in the range determined by the position vector of the starting endpoint to the position vector of its final endpoint</td>
</tr>
<tr>
<td></td>
<td>z_from_origin</td>
<td>measures from the starting endpoint (or Origin) of the Line Tool (or 1D Part) to its final endpoint; all the RMS sums of just the x, y, or z components of the line segments in the range determined by the position vector of the starting endpoint to the position vector of its final endpoint</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair. Only applicable with the "query_ent_var: type distance" command.

**Example Usage:**

```
# Modify to parameterize using only the x-component of the arc length
#
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: constrain line_tool
query_ent_var: distance x_arc_length
query_ent_var: modify_end
```

**See Also:**

Associated query_ent_var commands
**Command:**

```
query_ent_var: elem_id <element_id_> #
```

**Purpose:**

Specify the element id used to perform the specified element constrained query.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>element_id_#</td>
<td>valid element id number (0-bias)</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type time" and "query_ent_var: constrain element" commands.

Only applicable on element-based variables.

Only applicable with the "query_ent_var: constrain element" and "query_ent_var: type time" commands.

**Example Usage:**

```
part: select_begin
4
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type time
query_ent_var: #_of_sample_pts 10
query_ent_var: begin_simtime 2.2300e+02
query_ent_var: end_simtime 4.8800e+02
query_ent_var: constrain element
query_ent_var: sample_by value
query_ent_var: variable NodeToElem
query_ent_var: elem_id 14
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
```

**See Also:**

Associated *query_ent_var* commands
### query_ent_var: end_simtime

**Command:**

```
query_ent_var: end_simtime <time_value>
```

**Purpose:**

Specify the ending simulation time used to stop the query over time.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time_value</td>
<td>ending simulation time value (that corresponds to a time step) at which to stop the computed query over time</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type time" command.

**Example Usage:**

```
#  # Select part
#  part: select_begin
2  part: select_end
#  # Query over time
#  query_ent_var: begin
query_ent_var: description
query_ent_var: type time
query_ent_var: #_of_sample_pts 84
query_ent_var: begin_simtime 2.2300e+02
query_ent_var: end_simtime 4.8800e+02
query_ent_var: constrain node
query_ent_var: sample_by value
query_ent_var: node_id 1
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
#  # Select resulting plot curve
#  curve: select_begin
0  curve: select_end
```

**See Also:**

Associated `query_ent_var` commands
**Command:**

```plaintext
query_ent_var: generate_over <type>
```

**Purpose:**

Specify whether the query is over time or distance.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>distance query is over distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time query is over time</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

**Example Usage:**

```plaintext
part: select_all
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type generated
query_ent_var: #_of_sample_pts 20
query_ent_var: begin_simtime 0.0000e+00
query_ent_var: end_simtime 0.1900e+02
query_ent_var: constrain node
query_ent_var: sample_by value
query_ent_var: node_id 139
query_ent_var: variable_1 temperature
query_ent_var: generate_over time
query_ent_var: variable_2 TIME
query_ent_var: end
query_ent_var: query
```

**See Also:**

Associated `query_ent_var` commands
query_ent_var: ijk

Command:

query_ent_var: ijk <i-plane_> <j-plane_> <k-plane_>

Purpose:

Specify the ijk location used to perform the specified ijk constrained query.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>i-plane_#</td>
<td>i, j, and k component values which must lie within the min/max of the i, j, and k range</td>
</tr>
<tr>
<td></td>
<td>j-plane_#</td>
<td></td>
</tr>
<tr>
<td></td>
<td>k-plane_#</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: constrain ijk" and "query_ent_var: type time" commands.

Example Usage:

```
part: select_begin
  4
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type time
query_ent_var: #_of_sample_pts 10
query_ent_var: begin_simtime 2.2300e+02
query_ent_var: end_simtime 4.8800e+02
query_ent_var: constrain ijk
query_ent_var: sample_by value
query_ent_var: variable temp
query_ent_var: ijk 2 4 14
query_ent_var: end
query_ent_var: query
curve: select_begin
  0
curve: select_end
```

See Also:

Associated query_ent_var commands
**Command:**

```
query_ent_var: line_loc <end_point_id> <x_comp> <y_comp> <z_comp>
```

**Purpose:**

Specify the location of the line used for distance queries when the constraint is set to `line_tool`.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td><code>end_point_id</code></td>
<td>endpoints of the line, either 1 or 2</td>
</tr>
<tr>
<td>float</td>
<td><code>x_comp</code></td>
<td>x, y, or z component of the corresponding line endpoint in model coordinates</td>
</tr>
<tr>
<td></td>
<td><code>y_comp</code></td>
<td></td>
</tr>
<tr>
<td></td>
<td><code>z_comp</code></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

**Example Usage:**

```
part: select_begin
1
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: line_loc 1 2.7770e-01 7.7363e-02 1.1348e-02
query_ent_var: line_loc 2 7.6144e-01 1.7007e-01 5.5697e-02
query_ent_var: variable Density
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
```

**See Also:**

Associated `query_ent_var` commands
query_ent_var: marker_rgb

Command:

```
query_ent_var: marker_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specify the color for the visible markers indicating query location.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, or blue component of color (0. to 1.)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Used only if query_ent_var: marker_visible is on.

Example Usage:

```
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: constrain 1d_part
query_ent_var: marker_rgb 1.0000e+00 0.0000e+00 1.0000e+00
query_ent_var: modify_end
```

See Also:

Associated query_ent_var commands
Command:

`query_ent_var: marker_size_normalized <size_value>`

Purpose:

Specify the size of a query marker.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size_value</td>
<td>size of the marker</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Used only if `query_ent_var:marker_visible` is on.

A size of 1.0 indicates to use the computed size.

Values >1 scale the computed size larger while values <1 (but >0) shrink the marker.

Example Usage:

```
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: constrain 1d_part
query_ent_var: marker_size_normalized 2.0000e+00
query_ent_var: modify_end
```

See Also:

Associated `query_ent_var` commands
**query_ent_var: marker_visible**

**Command:**

```plaintext
query_ent_var: marker_visible <toggle>
```

**Purpose:**

The begin/end construct in which to modify query entity attributes.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>(default for distance queries) toggle-on the marker</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>(default for time queries) toggle-off the marker</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

If the query type is distance, then the marker is placed at the location of the origin (starting endpoint).

**Example Usage:**

```plaintext
query_ent_var: modify_begin
query_ent_var: type time
query_ent_var: constrain element
query_ent_var: marker_type OFF
query_ent_var: modify_end
```

**See Also:**

Associated `query_ent_var` commands
Command:

```
query_ent_var: modify_begin
query_ent_var: modify_end
```

Purpose:

Delimit the modifications for query entity attributes.

Notes:

These commands are used to set the attributes for a query entity.

Parameters:

None.

Example Usage:

```
# Modification change:
#
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: modify_end
```

See Also:

Associated `query_ent_var` commands
query_ent_var: multiple_segments_by

Command:

query_ent_var: multiple_segments_by <option>

Purpose:
Treat multiple line segments of a distance query as multiple queries, (i.e., reset the distance to 0. for each segment) or as a continuous line.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>accumulation</td>
</tr>
<tr>
<td></td>
<td>reset_each</td>
<td>treat multiple line segments as a continuous line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>treat multiple line segments as separate queries</td>
</tr>
</tbody>
</table>

Notes:
This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type distance" command.

Example Usage:

query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: constrain 1d_part
query_ent_var: multiple_segments_by reset_each
query_ent_var: modify_end

See Also:
Associated query_ent_var commands
Command:

```
query_ent_var: node_id <node_id_#>
```

Purpose:

Specify the node id in which to perform the specified node constrained query.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>node_id_#</td>
<td>node id, or label, number</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: constrain node" command. Only applicable on node-based variables.

Example Usage:

```
#  # Select part
#  part: select_begin
  2
#  part: select_end
#  # Query over time
#  #  query_ent_var: begin
#  query_ent_var: description
#  query_ent_var: type time
#  query_ent_var: #_of_sample_pts 84
#  query_ent_var: begin_simtime 2.2300e+02
#  query_ent_var: end_simtime 4.8800e+02
#  query_ent_var: constrain node
#  query_ent_var: sample_by value
#  query_ent_var: node_id 1
#  query_ent_var: variable temp
#  query_ent_var: end
#  query_ent_var: query
```

See Also:

Associated `query_ent_var` commands
Command:

    query_ent_var: operation_factor1 <scale>
    query_ent_var: operation_factor2 <scale>

Purpose:

Specify the scale factor to apply to the one or two existing queries of an operation query.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale</td>
<td>value to scale the respective query by</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

    query_ent_var: begin
    query_ent_var: description
    query_ent_var: query_type operation
    query_ent_var: operation_factor1 2.0000e+00
    query_ent_var: operation_factor2 -1.5000e+01
    query_ent_var: operation_query1byname Distance vs. temp for line tool
    query_ent_var: operation_query2byname Time vs. temp for Node 1
    query_ent_var: end
    query_ent_var: query

See Also:

Associated query_ent_var commands
Command:

```
query_ent_var: operation_query1byname <name>
query_ent_var: operation_query2byname <name>
```

Purpose:

Specify the name of the one or two existing queries of an operation query.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>existing query name</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

```
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type operation
query_ent_var: operation_factor1 2.0000e+00
query_ent_var: operation_factor2 -1.5000e+01
query_ent_var: operation_query1byname Distance vs. temp for line tool
query_ent_var: operation_query2byname Time vs. temp for Node 1
query_ent_var: end
query_ent_var: query
```

See Also:

Associated `query_ent_var` commands
**query_ent_var: origin**

**Command:**

```
query_ent_var: origin <x_coord> <y_coord> <z_coord>
```

**Purpose:**

Specify a location which will be used to select the origin of a distance plot when performing the query on a 1D part.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>X, y, or z coordinate value in model coordinates</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type distance" and "query_ent_var: constrain 1d_part" commands.

The end point closest to the origin specified will be used as the “origin” of the query, i.e., where distance = 0.

If the ID part is a closed loop (i.e., there are no end points), the closest point on the loop is used as the “origin”.

**Example Usage:**

```
query_ent_var: modify_begin
query_ent_var: origin 2.3596e+00 1.8494e+00 1.1773e+01
query_ent_var: modify_end
```

**See Also:**

Associated `query_ent_var` commands
Command:

```
query_ent_var: part_id <part_id_#>
```

Purpose:

Specify the 1D part number to query when performing a query over distance with a part constraint.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_id_#</td>
<td>GUI number of the part</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

```
part: select_begin
4
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type distance
query_ent_var: part_id 4
query_ent_var: constrain 1d_part
query_ent_var: distance arc_length
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
```

See Also:

Associated query_ent_var commands
query_ent_var: part_idbyname

Command:

query_ent_var: part_idbyname <part_name>

Purpose:

Specify the 1D part name to query when performing a query over distance with a part constraint.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>part_name</td>
<td>GUI name of the part</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

```
part: select_begin
Flow Field
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type distance
query_ent_var: part_idbyname Line Clip
query_ent_var: constrain 1d_part
query_ent_var: distance arc_length
query_ent_var: variable temp
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
```

See Also:

Associated query_ent_var commands
**Command:**

```
query_ent_var: query
```

**Purpose:**

Specify the creation of a query entity.

**Parameters:**

None.

**Notes:**

The query is created using the current query attributes.

**Example Usage:**

```
part: select_begin
1
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: line_loc 1 2.7770e-01 7.7363e-02 1.1348e-02
query_ent_var: line_loc 2 7.6144e-01 1.7007e-01 5.5697e-02
query_ent_var: variable Density
query_ent_var: end
query_ent_var: query
curve: select_begin
0
curve: select_end
```

**See Also:**

Associated `query_ent_var` commands
**query_ent_var: query_type**

**Command:**

\[
\text{query_ent_var: query_type } \text{<type>}
\]

**Purpose:**

Specify the type of query to be created.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>generated</td>
</tr>
<tr>
<td></td>
<td>operation</td>
<td>scaling and algebraic sum operation on existing queries</td>
</tr>
<tr>
<td></td>
<td>external</td>
<td>loading externally created or previously saved queries</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

**Example Usage:**

```
part: select_all
#
# At line tool over distance query
#
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type generated
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: constrain line_tool
query_ent_var: line_loc 1 -7.5000e-01 1.1561e+00 1.0000e+00
query_ent_var: line_loc 2 1.7500e+00 1.1561e+00 1.0000e+00
query_ent_var: variable_1 temperature
query_ent_var: generate_over distance
query_ent_var: variable_2 DISTANCE
query_ent_var: end
query_ent_var: query
```

**See Also:**

Associated *query_ent_var* commands
Command:

```
query_ent_var: sample_by <option>
```

Purpose:

Specify how to report values queried over time.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>fft</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Only applicable with the "query_ent_var: type time" command.

Example Usage:

```
#  # Select part  
#  part: select_begin
#  2  part: select_end
#  # Query over time
#  # query_ent_var: begin
#  query_ent_var: description
#  query_ent_var: type time
#  query_ent_var: _of_sample_pts 84
#  query_ent_var: begin_simtime 2.2300e+02
#  query_ent_var: end_simtime 4.8800e+02
#  query_ent_var: constrain node
#  query_ent_var: sample_by value
#  query_ent_var: node_id 1
#  query_ent_var: variable temp
#  query_ent_var: end
#  query_ent_var: query
#  #  # Select resulting plot curve
#  #  curve: select_begin
#  #  0  curve: select_end
#  #  # Modified to sample by FFT
#  #  query_ent_var: modify_begin
#  query_ent_var: type time
#  query_ent_var: constrain node
#  query_ent_var: sample_by fft
#  query_ent_var: modify_end
```
query_ent_var: sample_by

See Also:

Associated query_ent_var commands
Command:

```
query_ent_var: select_all_timesteps
```

Purpose:

Causes all current timesteps to be selected for querying.

Parameters:

None.

Notes:

This command is not generated by EnSight, but can be placed in a command file to generalize it so you don't have to know how many time steps are present. It can replace the `query_ent_var: begin_simtime` and `query_ent_var: end_simtime` commands.

Example Usage:

```
part: select_begin
  1
part: select_end
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type generated
query_ent_var: #_of_sample_pts 20
query_ent_var: select_all_timesteps
query_ent_var: constrain node
query_ent_var: sample_by value
query_ent_var: node_id 100
query_ent_var: variable_1 Stress
query_ent_var: generate_over time
query_ent_var: variable_2 TIME
query_ent_var: end
query_ent_var: query
curve: select_begin
  0
curve: select_end
```

See Also:

Associated `query_ent_var` commands
**query_ent_var: type**

**Command:**

```
query_ent_var: type <domain>
```

**Purpose:**

Specify the domain over which to perform the query.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>domain</td>
<td>distance to query along a line using the Line Tool or 1D Part at the current time step</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time to query variable values or FFT's over a specified range of time steps. (This outputs for the selected variable a value versus time or FFT frequency versus FFT spectral values)</td>
</tr>
</tbody>
</table>

**Notes:**

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

**Example Usage:**

```
# Modification example of a distance query
#
query_ent_var: modify_begin
query_ent_var: type distance
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: modify_end
```

**See Also:**

Associated `query_ent_var` commands
Command:

query_ent_var: variable_1 <name>
query_ent_var: variable_2 <name>

Purpose:

Specify the variables to be queried. The first variable can be any active variable. The second variable can be distance, time, or a second active variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string or constant</td>
<td>name</td>
<td>name of the active variable. For variable_1 it can be any active variable. For variable_2, it can be DISTANCE if a non-scatter query over distance is being created, TIME if a non-scatter query over time is being created, or any active variable if a scatter query is being created. If plotted, variable_1 will be the Y-axis variable and variable_2 will be the X-axis variable.</td>
</tr>
</tbody>
</table>

Notes:

This command must lie between either a "query_ent_var: begin" and "query_ent_var: end" pair, or a "query_ent_var: modify_begin" and "query_ent_var: modify_end" pair.

Example Usage:

part: select_all
#
# At line tool over distance query
#
query_ent_var: begin
query_ent_var: description
query_ent_var: query_type generated
query_ent_var: #_of_sample_pts 20
query_ent_var: constrain line_tool
query_ent_var: constrain line_tool
query_ent_var: line_loc 1 -7.5000e-01 1.1561e+00 1.0000e+00
query_ent_var: line_loc 2 1.7500e+00 1.1561e+00 1.0000e+00
query_ent_var: variable_1 temperature
query_ent_var: generate_over distance
query_ent_var: variable_2 DISTANCE
query_ent_var: end
query_ent_var: query

See Also:

Associated query_ent_var commands
Commands in this Section:

query_interact

query_interact: #_displayed <num>
query_interact: create <parameters>
query_interact: display_id <toggle>
query_interact: label_always_on_top <toggle>
query_interact: label_rgb <red_val> <grn_val> <blu_val>
query_interact: marker_size_normalized <scale>
query_interact: marker_visible <toggle>
query_interact: query <query_type>
query_interact: request_method <method>
query_interact: save <filename>
query_interact: search <search_mode>
query_interact: select_default
query_interact: select_varname_begin
query_interact: select_varname_end

See Also:

User Manual - Section 7.12, Interactive Probe Query
How To Probe Interactively
query_interact: #_displayed

Command:

```plaintext
query_interact: #_displayed  <num>
```

Purpose:

Specifies how many query markers and report lines will be displayed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of queries</td>
</tr>
</tbody>
</table>

Notes:

This defines a stack size. Once full, the oldest query is popped off the stack.

Example Usage:

```plaintext
variable: activate pressure
query_interact: select_varname_begin
  pressure
query_interact:  select_varname_end
query_interact: query xyz
query_interact: #_displayed 3
query_interact: create 12.0 15.1 10.3
query_interact: create 11.0 15.0 10.1
query_interact: create 10.0 15.0 10.3
```

See Also:

Associated `query_interact` commands
Command:

query_interact: create <parameters>

Purpose:

Creates a query using the current settings.

Parameters:

<table>
<thead>
<tr>
<th>Surface Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>float</td>
<td>screen_x</td>
<td>xy normalized screen coordinates (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>screen_y</td>
<td>query occurs on closest surface</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cursor Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>float</td>
<td>x_coord</td>
<td>xyz model coordinates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y_coord</td>
<td>query occurs on point specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Node Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>int</td>
<td>node_id</td>
<td>node id for query</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IJK Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>int</td>
<td>i_coord</td>
<td>ijk coordinates for query</td>
</tr>
<tr>
<td></td>
<td></td>
<td>j_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>k_coord</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Element Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>int</td>
<td>element_id</td>
<td>element id for query</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>XYZ Query</th>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>float</td>
<td>x_coord</td>
<td>xyz model coordinates</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y_coord</td>
<td>query occurs on point specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The parameters vary based on the type of query being used. (See query_interact: query)

Query is performed at location specified or at closest node if query_interact: search closest_node is specified.
query_interact: create

Example Usage:

```
variable: activate pressure
query_interact: select_varname_begin
pressure
query_interact: select_varname_end
query_interact: query xyz
query_interact: create 12.0 15.1 10.3
```

See Also:

Associated `query_interact` commands
Command:

`query_interact: display_id <toggle>`

Purpose:

Causes the node located for the query to be reported.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command is used with `query_interact: search closest_node` to get reporting of the actual node that was used for the query.

Example Usage:

```plaintext
variable: activate pressure
query_interact: select_varname_begin
  pressure
query_interact: select_varname_end
query_interact: query_cursor
query_interact: search closest_node
query_interact: display_id ON
query_interact: create 12.0 15.1 10.3
```

See Also:

Associated `query_interact` commands
query_interact: label_always_on_top

Command:

    query_interact: label_always_on_top <toggle>

Purpose:

Causes the label written beside the query marker in the graphics window to be rendered on top of any surface that would normally hide or obscure it.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: do not obscure by geometry</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: draw only if label is not obscured by geometry</td>
</tr>
</tbody>
</table>

Notes:

This attribute is ON by default.

Example Usage:

    variable: activate pressure
    query_interact: select_varname_begin
    pressure
    query_interact: select_varname_end
    query_interact: query_cursor
    query_interact: label_always_on_top ON
    query_interact: create 12.0 15.1 10.3

See Also:

Associated query_interact commands
Command:

```
query_interact: label_rgb  <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the RGB color value of the label written next to the query marker in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue contributions of the color within range of 0.0 to 1.0</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
variable: activate pressure
query_interact: select_varname_begin
pressure
query_interact: select_varname_end
query_interact: query cursor
query_interact: label_rgb 0 1 1
query_interact: create 12.0 15.1 10.3
```

See Also:

Associated `query_interact` commands
query_interact: marker_size_normalized

Command:

query_interact: marker_size_normalized <scale>

Purpose:

Specify the size of a query marker.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale</td>
<td>size of marker</td>
</tr>
</tbody>
</table>

Notes:

The default marker scale value is 1.0.

A size of 1.0 indicates to use the computed size.

Values >1 scale the computed size larger while values <1 (but >0) shrink the marker.

Example Usage:

variable: activate pressure
query_interact: variable pressure
query_interact: query cursor
query_interact: label_visible OFF
query_interact: marker_size_normalized 0.5
query_interact: create 12.0 15.1 10.3

See Also:

Associated query_interact commands
Command:

query_interact: marker_visible <toggle>

Purpose:

Sets the visibility of the query marker in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON make markers visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF do not display markers</td>
</tr>
</tbody>
</table>

Notes:

Marker visibility is ON by default.

Example Usage:

variable: activate pressure
query_interact: select_varname_begin
pressure
query_interact: select_varname_end
query_interact: query_cursor
query_interact: label_visible OFF
query_interact: marker_visible OFF
query_interact: create 12.0 15.1 10.3

See Also:

Associated query_interact commands
query_interact: query

Command:

query_interact: query <query_type>

Purpose:

Sets the type of query to be performed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>query_type</td>
<td>may be any of the following values:</td>
</tr>
<tr>
<td></td>
<td>surface</td>
<td>causes the query to occur at a point defined on the first surface encountered by a projection of a given screen x/y coordinate into the z dimension. The x/y coordinates will be specified as arguments to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>cursor</td>
<td>causes the query to occur at the cursor location specified as an argument to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>node</td>
<td>causes the query to occur at a specified node. The node id will be specified as an argument to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>ijk</td>
<td>causes the query to occur at a specific location in an ijk space. The ijk coordinates will be specified as arguments to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>element</td>
<td>element – causes the query to occur at a specified element. The element id will be specified as an argument to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>xyz</td>
<td>causes the query to occur at a specific location in an xyz space. The xyz coordinates will be specified as arguments to the query_interact: create command</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>turns query off</td>
</tr>
</tbody>
</table>

Notes:

The exact location of the query, as specified above, may be modified by the query_interact: search command; i.e. if an exact set of coordinates or a cursor position is specified, the actual query may be done at the closest node to this point if query_interact: search closest_node has been specified.

Example Usage:

variable: activate pressure
query_interact: select_varname_begin pressure
query_interact: select_varname_end
query_interact: query cursor
query_interact: searchclosest_node
query_interact: create 12.0 15.1 10.3
See Also:

Associated query_interact commands
query_interact: request_method

Command:

```plaintext
query_interact: request_method <method>
```

Purpose:

Sets the request method for surface pick or cursor-based queries to be on a request or continuous basis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>may be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>continuous automatically update as mouse/cursor moves</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pick create the query only when requested via a pick action</td>
</tr>
</tbody>
</table>

Notes:

In continuous mode, the query will be updated continuously while the mouse or cursor is being moved.

Example Usage:

```plaintext
variable: activate pressure
query_interact: select_varname_begin pressure
query_interact: select_varname_end
query_interact: query cursor
query_interact: request_method pick
query_interact: create 12.0 15.1 10.3
```

See Also:

Associated `query_interact` commands
query_interact: save

Command:

query_interact: save <filename>

Purpose:

 Specifies the filename into which the Interactive Probe Query Results Table will be saved.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>filename to receive the results table information</td>
</tr>
</tbody>
</table>

Example Usage:

variable: activate pressure
query_interact: select_varname_begin
pressure
query_interact: select_varname_end
query_interact: query xyz
query_interact: #_displayed 3
query_interact: create 12.0 15.1 10.3
query_interact: create 11.0 15.0 10.1
query_interact: create 10.0 15.0 10.3
query_interact: save /home/users/me/probe.txt

See Also:

Associated query_interact commands
query_interact: search

Command:

query_interact: search <search_mode>

Purpose:

Sets the search mode for surface pick or cursor queries.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>search_mode</td>
<td>may be any of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>exact: query to be done at the exact point specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>closest_node: query to occur at the node closest to the specified point</td>
</tr>
</tbody>
</table>

Example Usage:

variable: activate pressure
query_interact: select_varname_begin
pressure
query_interact: select_varname_end
query_interact: query cursor
query_interact: search closest_node
query_interact: create 12.0 15.1 10.3

See Also:

Associated query_interact commands
query_interact: select_default

Command:
query_interact: select_default

Purpose:
Causes any following query_interact: commands to affect the default query settings.

Parameters:
none

Notes:
All query_interact: commands following query_interact: select_default will affect default settings until a new variable is selected to query using query_interact: select_varname_begin.

Example Usage:
query_interact: select_default
query_interact: marker_visible OFF
query_interact: marker_rgb 1 0 0
query_interact: select_varname_begin
pressure
query_interact: select_varname_end

See Also:
Associated query_interact commands
**query_interact: select_varname_begin/end**

**Command:**

```plaintext
query_interact: select_varname_begin
<varname1 varname2 ...varnameN>
query_interact: select_varname_end
```

**Purpose:**

Specifies the variables to be queried.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>varnameN</td>
<td>names of variables to be queried</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
variable: activate pressure
variable: activate temperature
query_interact: select_varname_begin
pressure
temperature
query_interact: select_varname_end
query_interact: query cursor
query_interact: create 12.0 15.1 10.3
```

**See Also:**

Associated `query_interact` commands
Commands in this Section:

savegeom

savegeom: begin_step <step>
savegeom: binary <toggle>
savegeom: brick_format <option>
savegeom: end_step <step>
savegeom: format <option>
savegeom: maximum_file_size <size>
savegeom: parameters <input_string>
savegeom: resolution <x> <y> <z>
savegeom: save_geometric_entities <filename_prefix>
savegeom: select_all_steps
savegeom: single_file <toggle>
savegeom: step_by <increment>
savegeom: undefined <undef_value>
savegeom: variable <var_name>

See Also:

User Manual - Section 6.1, File Menu Functions
How To Save Geometric Entities
savegeom: brick_format

Command:

    savegeom: brick_format <option>

Purpose:

Specify the format of the values to write out when using brick format.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>bytes for brick of bytes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>floats for brick of floats</td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with `savegeom: format brick`

Example Usage:

    part: select_all
    savegeom: format brick
    savegeom: brick_format floats
    savegeom: resolution 128 128 128
    savegeom: undefined -1.2345e-10
    savegeom: variable pressure
    savegeom: save_geometric_entities /tmp/file_prefix

See Also:

Associated `savegeom` commands
Command:

```
savegeom: begin_step <step>
savegeom: end_step <step>
```

Purpose:

Specify the beginning/ending time step for exporting the selected part(s) and active variable(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step</td>
<td>the beginning/ending time step in the range ([0,n]), where (n) is the last time step</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: begin_step 0
savegeom: end_step 16
savegeom: step_by 1
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
Command:

```
savegeom: binary <toggle>
```

Purpose:

Specify either binary or ASCII as the format for the exported files.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON Binary format</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF ASCII format</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
savegeom: format

Command:

```
savegeom: format <option>
```

Purpose:

Specify the export data file format for the selected part(s) and active variable(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>Include one of the following:</td>
</tr>
<tr>
<td></td>
<td>brick</td>
<td>EnSight volume rendering format</td>
</tr>
<tr>
<td></td>
<td>case</td>
<td>EnSight Gold case file format</td>
</tr>
<tr>
<td></td>
<td>vrml</td>
<td>VRML (version 2.0) file format</td>
</tr>
<tr>
<td></td>
<td>UDWName</td>
<td>Where UDWName can be any one of the user-defined writer names that appear in the Save Geometric Entities dialog.</td>
</tr>
</tbody>
</table>

Notes:

The `option` is the format of an included internal format such as `case` or `vrml`, or a user-defined format that can be site specific.

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
Command:

\texttt{savegeom: maximum\_file\_size <size>}

Purpose:

Specify the maximum file size (in MBs) for exporting time step data into single file format.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>file size limit in MB (Mega-Bytes)</td>
</tr>
</tbody>
</table>

Notes:

This default value is the maximum file size limit of either 2 Giga-Bytes for 32-bit architecture, or 4 Tera-Bytes for 64-bit architecture machines.

Example Usage:

\begin{verbatim}
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file ON
savegeom: maximum_file_size 2147.479980
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
\end{verbatim}

See Also:

Associated savegeom commands
Command:

```
savegeom: parameters <input_string>
```

Purpose:

Pass into the User-defined writer a string that can be used to modify the behavior, or supply additional parameters.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>input_string</td>
<td>up to 200 characters of information that will be passed into the user-defined writer selected.</td>
</tr>
</tbody>
</table>

Notes:

This can be used to provide parameters to a user-defined writer.

Example Usage:

```
part: select_all
savegeom: format STL
savegeom: parameters test string
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
savegeom: resolution

Command:

```
savegeom: resolution <x> <y> <z>
```

Purpose:

Specify the Brick of Values resolution in the x, y, and z directions.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>x</td>
<td>X, y, z direction resolution</td>
</tr>
<tr>
<td></td>
<td>y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with `savegeom: format brick`

Example Usage:

```
part: select_all
savegeom: format brick
savegeom: brick_format floats
savegeom: resolution 128 128 128
savegeom: undefined -1.2345e-10
savegeom: variable pressure
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
savegeom: save_geometric_entities

Command:

```
savegeom: save_geometric_entities <filename_prefix>
```

Purpose:

Specify the file name path and prefix for the selected part and active variable data to be exported.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename_prefix</td>
<td>directory path and filename prefix to be used for the exported data file</td>
</tr>
</tbody>
</table>

Notes:

The exported files will be saved in the current working directory of the server if no path is provided.

If the format (as defined by `savegeom: format`) is VRML, the filename given will be used directly. If the format is CASE, the multiple files (case, geometry, and variables) are written using the supplied name as the prefix.

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
or:
part: select_begin
1
part: select_end
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
savegeom: select_all_steps

Command:

    savegeom: select_all_steps

Purpose:

Specify all time step data of selected parts (geometry) and active variables to be exported to an EnSight case or VRML file(s).

Parameters:

    none

Example Usage:

    part: select_all
    savegeom: format case
    savegeom: binary ON
    savegeom: single_file OFF
    savegeom: select_all_steps
    savegeom: save_geometric_entities /tmp/file_prefix

See Also:

    Associated savegeom commands
Command:

```
savegeom: single_file <toggle>
```

Purpose:

Specify whether the selected part(s), or geometry, and each active variable will be exported to a single or to separate time step files.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>combine all geometry time step data into a single file; also for each variable, combine all respective variable timestep data into a single file.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>export data for each geometry time step and each variable time step to a separate file</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file ON
savegeom: maximum_file_size 2147.479980
savegeom: select_all_steps
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
savegeom: step_by

Command:

```
savegeom: step_by <increment>
```

Purpose:

Specify the increment step by which to stride the time steps in exporting the selected part(s) and active variable(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>increment</td>
<td>increment to stride the time steps in the range of the beginning and ending time steps</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_all
savegeom: format case
savegeom: binary ON
savegeom: single_file OFF
savegeom: begin_step 0
savegeom: end_step 16
savegeom: step_by 1
savegeom: save_geometric_entities /tmp/file_prefix
```

See Also:

Associated `savegeom` commands
**Command:**

```
savegeom: undefined <undef_value>
```

**Purpose:**

Specify the value to write out as undefined when using brick format.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>undef_value</td>
<td>any undefined value is written out as this value</td>
</tr>
</tbody>
</table>

**Notes:**

Used in conjunction with `savegeom: format brick`

**Example Usage:**

```
part: select_all
savegeom: format brick
savegeom: brick_format floats
savegeom: resolution 128 128 128
savegeom: undefined -1.2345e-10
savegeom: variable pressure
savegeom: save_geometric_entities /tmp/file_prefix
```

**See Also:**

Associated `savegeom` commands
savegeom: variable

Command:

\texttt{savegeom: variable <var\_name>}

Purpose:

Specify the name of the variable to save when using brick format.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var_name</td>
<td>variable name</td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with \texttt{savegeom: format brick}

Example Usage:

\texttt{part: select\_all}
\texttt{savegeom: format brick}
\texttt{savegeom: brick\_format floats}
\texttt{savegeom: resolution 128 128 128}
\texttt{savegeom: undefined -1.2345e-10}
\texttt{savegeom: variable pressure}
\texttt{savegeom: save\_geometric\_entities /tmp/file\_prefix}

See Also:

Associated \texttt{savegeom} commands
commands in this section:

sepattach

sepattach: begin
sepattach: end
sepattach: create
sepattach: density <variable_name>
sepattach: display_offset <offset_value>
sepattach: method <option>
sepattach: momentum <variable_name>
sepattach: ratio_of_spec_heat <name or value>
sepattach: select_default
sepattach: threshold <variable_name>
sepattach: threshold_filter <option>
sepattach: threshold_max <threshold_value>
sepattach: threshold_min <threshold_value>
sepattach: threshold_value <threshold_value>
sepattach: velocity <variable_name>

see also:

user manual - section 7.21, separation/attachment lines create/update
how to extract separation and attachment lines


**sepatcch: begin/end**

**Command:**

```plaintext
sepatcch: begin
sepatcch: end
```

**Purpose:**

Delimit the modifications for separation or attachment line attributes.

**Parameters:**

None.

**Notes:**

These commands are used to set the attributes for a separation or attachment line part creation.

**Example Usage:**

```plaintext
#
# Specify the 2D parent part(s) from which
# to create the separation and attachment lines
#
part: select_begin
  2 3
part: select_end
#
# Compute the separation and attachment lines parts
#
sepatcch: begin
sepatcch: end
sepatcch: create
#
# Now select the newly created separation and
# attachment line parts for subsequent operations
#
part: select_begin
  6 7
part: select_end
```

**See Also:**

Associated `sepatcch` commands
**Command:**

`sepattach: create`

**Purpose:**

Create separation and attachment line parts using the currently selected 2D parts and defined attributes.

**Parameters:**

None.

**Notes:**

This feature is different from other features in that it creates two parts, i.e. a separation line part, and an attachment line part. In addition, both of these parts are modified with any command change applied to either one or both of these parts.

**Example Usage:**

```
# Specify the 2D parent part(s) from which
# to create the separation and attachment lines
#
part: select_begin
  2 3
part: select_end
#
# Compute the separation and attachment lines parts
#
sepattach: begin
sepattach: end
sepattach: create
#
# Now select the newly created separation and
# attachment line parts for subsequent operations
#
part: select_begin
  6 7
part: select_end
```

**See Also:**

Associated `sepattach` commands
Command:

```
sepattach: density <variable_name>
```

Purpose:
Specify the density variable to use in creating/updating the default separation and attachment line part attributes and/or the selected separation and attachment line part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the density variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:
This variable is assigned automatically if the variable name description `<Density>` exists. Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```
variables: activate Density
sepattach: select_default
part: modify_begin
sepattach: density Density
part: modify_end
```

See Also:
Associated `sepattach` commands
Command:

```plaintext
sepattach: display_offset <offset_value>
```

Purpose:
Specify the offset from the 2D parent part(s) surface from which to display (or lift) the separation and attachment line parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset_value</td>
<td>numerical offset value from the 2D surface, (default = 0.)</td>
</tr>
</tbody>
</table>

Notes:
This offset measures in model coordinate units, in the normal direction from the 2D parent part(s) surface(s); and thus, may need to be specified as either a + or - number.

Example Usage:

```plaintext
part: modify_begin
sepattach: display_offset -1.0000e-03
part: modify_end
```

See Also:
Associated `sepattach` commands
Command:

```plaintext
sepattach: method <option>
```

Purpose:

Specify the method, or algorithm, in which to compute the separation and attachment line parts, from either 2D parent part(s) or in recomputing existing 1D separation and attachment line parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>phase_plane</td>
</tr>
</tbody>
</table>

Currently only one algorithm offered.

Example Usage:

```plaintext
part: select_begin
6 7
part: select_end
part: modify_begin
sepattach: method phase_plane
part: modify_end
```

See Also:

Associated `sepattach` commands
Command:

`sepattach: momentum <variable_name>`

Purpose:

Specify the momentum variable to use in creating/updating the default separation and attachment line part attributes and/or the selected separation and attachment line part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the momentum variable (the default <code>&lt;none&gt;</code> means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name description `<Momentum>` exists. Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```plaintext
variables: activate Momentum
sepattach: select_default
part: modify_begin
sepattach: momentum Momentum
part: modify_end
```

See Also:

Associated `sepattach` commands
**sepattach: ratio_of_spec_heat**

**Command:**

```
sepattach: ratio_of_spec_heat <name or value>
```

**Purpose:**

Specify the ratio of specific heat constant value or variable name to use in creating/updating the default separation and attachment line attributes and/or selected separation and attachment part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>scalar field variable name for the ratio of specific heats</td>
</tr>
<tr>
<td>float</td>
<td>value</td>
<td>constant value (default = 1.4) for the ratio of specific heats</td>
</tr>
</tbody>
</table>

**Notes:**

The `<name or value>` can be multiple types depending on variable definition.

**Example Usage:**

```
sepattach: select_default
part: modify_begin
sepattach: ratio_of_spec_heat 1.4
part: modify_end
```

**See Also:**

Associated `sepattach` commands
Command:

\texttt{sepattach: select_default}

Purpose:

Specify that the default attributes of the separation and attachment line parts are to be set for all subsequent separation and attachment line creates and updates.

Parameters:

None.

Example Usage:

\begin{verbatim}
sepattach: select_default
part: modify_begin
sepattach: momentum none
part: modify_end
\end{verbatim}

See Also:

Associated \texttt{sepattach} commands
sepattach: threshold

Command:

    sepattach: threshold <variable_name>

Purpose:

Specify the threshold variable description by which to filter the segments of the selected separation
and attachment line parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the scalar variable by which to filter the vortex core segments</td>
</tr>
</tbody>
</table>

Notes:

The default threshold variable for vortex cores is "fx_sep_att_strengh".

Example Usage:

    part: select_begin
    5
    part: select_end
    part: modify_begin
    sepattach: threshold Density
    part: modify_end

See Also:

Associated sepattach commands
Command:

```
sepattach: threshold_filter <option>
```

**Purpose:**

Specify how to filter out segments of the specified separation and attachment line part, according to the specified threshold variable and value.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>&lt; filter out all values of the specified threshold variable less than the specified threshold value (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; filter out all values of the specified threshold variable greater than the specified threshold value</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
part: select_begin
  5
part: select_end
part: modify_begin
sepattach: threshold_filter >
part: modify_end
```

**See Also:**

Associated `sepattach` commands
sepattach: threshold_max/min

Command:

```
sepattach: threshold_max <threshold_value>
sepattach: threshold_min <threshold_value>
```

Purpose:

Specify the maximum/minimum threshold limit under which to filter the threshold value of the selected separation and attachment line part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>maximum/minimum threshold variable range limit below which to threshold the separation and attachment lines parts</td>
</tr>
</tbody>
</table>

Notes:

This max must be greater than the min value, and be a valid threshold variable value.

Example Usage:

```
part: select_begin
  5
part: select_end
part: modify_begin
part: sepattach: threshold_max 1.0000e+01
part: modify_end
```

See Also:

Associated sepattach commands
Command:

sepattach: threshold_value <threshold_value>

Purpose:

Specify the threshold value by which to filter the segments from the selected separation and attachment line part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>variable value by which to apply the threshold filter to the vortex core segments</td>
</tr>
</tbody>
</table>

Notes:

This value is automatically set to the minimum separation and attachment line strength variable value of the separation and attachment line parts.

Example Usage:

```plaintext
part: select_begin
   5
part: select_end
part: modify_begin
sepattach: threshold_value 5.0000e-01
part: modify_end
```

See Also:

Associated sepattach commands
seppatch: velocity

Command:

```
seppatch: velocity <variable_name>
```

Purpose:

Specify the velocity variable to use in creating/updating the default separation and attachment line part attributes and/or the selected separation and attachment line part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the velocity variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name description `<Velocity>` exists. Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```
variables: activate Velocity
seppatch: select_default
part: modify_begin
seppatch: velocity Velocity
part: modify_end
```

See Also:

Associated `seppatch` commands
Commands in this Section:

shell

See Also:
shell

Command:

shell: <str>

Purpose:

Have EnSight execute a system command.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>str</td>
<td>a system command line</td>
</tr>
</tbody>
</table>

Notes:

A typical use of this command might be to move animation images from the local directory to an archive location.

Example Usage:

shell: cp image*.rgb /scratch/archive/

See Also:

Associated shell commands
Commands in this Section:

shock

shock: begin
shock: end
shock: create
shock: density <variable_name>
shock: enthalpy <variable_name>
shock: gas_constant <value or name>
shock: mach <variable_name>
shock: method <algorithm>
shock: momentum <variable_name>
shock: pressure <variable_name>
shock: ratio_of_spec_heat <name or value>
shock: select_default
shock: temperature <variable_name>
shock: threshold <variable_name>
shock: threshold_filter <option>
shock: threshold_max <threshold_value>
shock: threshold_min <threshold_value>
shock: threshold_value <threshold_value>
shock: total_energy <variable_name>
shock: variable <variable_name>
shock: velocity <variable_name>

See Also:

User Manual - Section 7.20, Shock Surface/Region Create/Update
How To Extract Shock Surfaces
shock: begin/end

Command:

shock: begin
<shock_command>
shock: end

Purpose:

Delimit the modifications for shock part attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>shock_command</td>
<td>&quot;shock: variable&quot; commands</td>
</tr>
</tbody>
</table>

Notes:

These commands are used to set the attributes for a shock part creation.

Example Usage:

```plaintext
# Specify the 3D parent part(s)
# from which to create the shock part
#
part: select_begin
  1
part: select_end
#
# Compute the shock part by the Surface method
#
shock: begin
shock: variable Pressure
shock: end
shock: create
#
# Now select the newly created shock part
# for subsequent operations
#
part: select_begin
  5
part: select_end

Or:

# Specify the 3D parent part(s)
# from which to create the shock part
#
part: select_begin
  1
part: select_end
#
# Compute the shock part by the Region method
#
shock: begin
shock: variable none
shock: end
shock: create
#```
# Now select the newly created shock part
# for subsequent operations
#
part: select_begin
  5
part: select_end

See Also:

Associated shock commands
shock: create

Command:

    shock: create

Purpose:

Create a shock part with the currently defined attributes using the currently selected 3D part(s).

Parameters:

None.

Example Usage:

    #
    # Specify the 3D parent part(s)
    # from which to create the shock part
    #
    part: select_begin
    1
    part: select_end
    #
    # Compute the shock part by the Surface method
    #
    shock: begin
    shock: variable Pressure
    shock: end
    shock: create
    #
    # Now select the newly created shock part
    # for subsequent operations
    #
    part: select_begin
    5
    part: select_end

See Also:

Associated shock commands
Command:

```
shock: density <variable_name>
```

Purpose:

Specify the density variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the density variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name <Density> exists.

Since the computation of separation and attachment lines depend on density, either the density variable must be defined or both the pressure and temperature variables must be defined to obtain the density variable.

Example Usage:

```
variables: activate Density
shock: select_default
part: modify_begin
shock: density Density
part: modify_end
```

See Also:

Associated shock commands
shock: enthalpy

Command:

    shock: enthalpy <variable_name>

Purpose:

Specify the enthalpy variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the enthalpy variable (the default name &lt;none&gt; means to use nothing).</td>
</tr>
</tbody>
</table>

Notes:

This variable is not needed unless you are computing the shock via the Region method and transient (moving) shocks are specified via the "test: toggle_moving_shock" command.

Example Usage:

    test: toggle_moving_shock
    variables: activate Enthalpy
    shock: select_default
    part: modify_begin
    shock: density Enthalpy
    part: modify_end

See Also:

Associated shock commands
shock: gas_constant

Command:

```
shock: gas_constant <value or name>
```

Purpose:

Specify the gas constant as a constant value or a variable name to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>scalar field variable name for the gas constant</td>
</tr>
<tr>
<td>float</td>
<td>value</td>
<td>a constant value (default =1.) for the gas constant</td>
</tr>
</tbody>
</table>

Example Usage:

```
shock: select_default
part: modify_begin
shock: gas_constant 1.
part: modify_end
```

See Also:

Associated `shock` commands
shock: mach

Command:

\[ \text{shock: mach <variable_name>} \]

Purpose:

Specify the mach variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the mach variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

Although the specification of this variable is optional, if it exists, its specification will save the creation of a temporary variable. If this variable is not specified or does not exist, it will be created on-the-fly temporarily as needed from dependent density, energy or pressure, velocity or momentum, and ratio of specific heats variables and values.

Example Usage:

variables: activate Mach
vortexcore: select_default
part: modify_begin
vortexcore: density Mach
part: modify_end

See Also:

Associated shock commands
Command:

```
shock: method <algorithm>
```

Purpose:

Specify the algorithm to use for the computation of the shock part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>algorithm</td>
<td>shock computed based on the Lovely and Haimes algorithm where the pressure gradient is dotted with the mach vector to compute a shock test value at each node of the 3D mesh</td>
</tr>
<tr>
<td>surface</td>
<td></td>
<td>(default) shock computed based on the Pagendarm algorithm where the shock position in the flow field is given by the maximal gradient of a quantity of density or pressure along the local flow direction</td>
</tr>
</tbody>
</table>

Notes:

The Surface method requires the specification of a shock threshold variable. The Region method does not require the specification of a shock threshold variable.

Example Usage:

```
part: select_begin
  8
part: select_end
part: modify_begin
shock: method region
part: modify_end
```

See Also:

Associated shock commands
shock: momentum

Command:

    shock: momentum <variable_name>

Purpose:

Specify the momentum variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the momentum variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name “momentum” exists.

Since the computation of shock depends on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

    variables: activate momentum
    shock: select_default
    part: modify_begin
    shock: momentum momentum
    part: modify_end

See Also:

Associated shock commands
Command:

```
shock: pressure <variable_name>
```

**Purpose:**

Specify the pressure variable to use in creating/updating a shock part or the default attributes.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the pressure variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

**Notes:**

This variable is used throughout the shock calculation. Although the specification of this variable is optional, if it exists, its specification will save the creation of a temporary variable. If this variable is not specified or does not exist, it will be created on-the-fly temporarily as needed from dependent density, energy, velocity or momentum, and ratio of specific heats variables and values.

**Example Usage:**

```
variables: activate Pressure
shock: select_default
part: modify_begin
shock: pressure Pressure
part: modify_end
```

**See Also:**

Associated shock commands
shock: ratio_of_spec_heat

Command:

\texttt{shock: ratio\_of\_spec\_heat <name or value>}

Purpose:

Specify the ratio of specific heat constant value or variable name to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>scalar field variable name for the ratio of specific heats</td>
</tr>
<tr>
<td>float</td>
<td>value</td>
<td>a constant value (default = 1.4) for the ratio of specific heats</td>
</tr>
</tbody>
</table>

Example Usage:

\begin{verbatim}
shock: select_default
part: modify_begin
shock: ratio_of_spec_heat 1.4
part: modify_end
\end{verbatim}

See Also:

Associated shock commands
Command:

shock: select_default

Purpose:

Specify that the default attributes of the shock part are to be set for all subsequent shock attribute updates.

Parameters:

None.

Example Usage:

vortexcore: select_default
part: modify_begin
shock: momentum none
part: modify_end

See Also:

Associated shock commands
shock: temperature

Command:

    shock: temperature <variable_name>

Purpose:

Specify the temperature variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the temperature variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

Although the specification of this variable is optional, if it exists, its specification will save the creation of a temporary variable.

This variable is required for the creation of Density if Density does not exist. If Density exists, no need to create this variable, unless you would like to use this as the shock creation variable for the Surface method.

Example Usage:

    variables: activate Temperature
    shock: select_default
    part: modify_begin
    shock: momentum Temperature
    part: modify_end

See Also:

Associated shock commands
**Command:**

```
shock: threshold <variable_name>
```

**Purpose:**

Specify the threshold variable description by which to filter the segments of the selected shock part.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the scalar variable by which to filter the vortex core segments</td>
</tr>
</tbody>
</table>

**Notes:**

The default threshold for the Region shock part is "SHK_Threshold". The default threshold for the Region shock part is "SHK_xxx", where xxx is the name of the variable used as the shock creation variable.

**Example Usage:**

```
part: select_begin
  8
part: select_end
part: modify_begin
shock: threshold Density
part: modify_end
```

**See Also:**

Associated shock commands
shock: threshold_filter

Command:

shock: threshold_filter <option>>

Purpose:

Specify how to filter out segments of the specified shock part, according to the specified threshold variable and value.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>&lt; (default) filter out all values of the specified threshold variable less than the specified threshold value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt; filter out all values of the specified threshold variable greater than the specified threshold value</td>
</tr>
</tbody>
</table>

Example Usage:

part: select_begin
8
part: select_end
part: modify_begin
shock: threshold_filter >
part: modify_end

See Also

Associated shock commands
**Command:**

```
shock: threshold_max <threshold_value>
shock: threshold_min <threshold_value>
```

**Purpose:**

Specify the maximum/minimum threshold limit under which to filter the threshold value of the selected shock part(s).

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>maximum/minimum threshold variable range limit below/above which to threshold the shock part</td>
</tr>
</tbody>
</table>

**Notes:**

Max must be greater than the min value, and be a valid threshold variable value.

**Example Usage:**

```
part: select_begin
  8
part: select_end
part: modify_begin
shock: threshold_min 0.1
shock: threshold_max 10.0
part: modify_end
```

**See Also:**

Associated shock commands
shock: threshold_value

Command:

shock: threshold_value <threshold_value>

Purpose:

Specify the threshold value by which to filter the elements from the selected shock part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>variable value by which to apply the threshold filter to the shock elements</td>
</tr>
</tbody>
</table>

Notes:

This value is automatically set to a value that should approximate the valid region in which the shock part should exist. Although for some models, further refinement and adjustment of the threshold min/max values is required.

This value must lie within the threshold variable interval [threshold_min, threshold_max].

Example Usage:

part: select_begin
8
part: select_end
part: modify_begin
shock: threshold_value 5.0000e-01
part: modify_end

See Also:

Associated shock commands
Command:

\[ \text{shock: total\_energy } \text{<variable\_name>} \]

Purpose:

Specify the total energy variable to use in creating/updating a shock part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the total energy variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

Although the specification of this variable is optional, if it exists, its specification will save the creation of a temporary variable.

This variable is required for the creation of Pressure if Pressure does not exist. If Pressure exists, no need to create this variable, unless you would like to use this as the shock creation variable for the Surface method.

Example Usage:

\[ \text{variables: activate TotalEnergy} \]
\[ \text{vortexcore: select\_default} \]
\[ \text{part: modify\_begin} \]
\[ \text{shock: velocity TotalEnergy} \]
\[ \text{part: modify\_end} \]

See Also:

Associated shock commands
shock: variable

Command:

```
shock: variable <variable_name>
```

Purpose:

Specify the variable (i.e. Density, Energy, Pressure, or Temperature) in which to create the Surface method shock part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the variable in which to use as the creation variable or the variable in which to apply the gradient calculations for the shock function</td>
</tr>
</tbody>
</table>

Notes:

For the Surface method, this variable is either Density, Energy, Pressure, or Temperature; and this variable must have previously been defined via its respective shock: density, energy, pressure, or temperature definition.

For the Region method, this variable is always pressure, and thus the specification is not needed; thus, <none> is used as the shock variable.

Example Usage:

```
# Specify the 3D parent part(s) from which to create the shock part
#
part: select_begin
  1
part: select_end
#
# Compute the shock part by the Surface method
#
shock: begin
shock: variable Pressure
shock: end
shock: create
#
# Now select the newly created shock part for subsequent operations
#
part: select_begin
  5
part: select_end
```

Or:

```
# Specify the 3D parent part(s) from which to create the shock part
#
part: select_begin
  1
part: select_end
#```
# Compute the shock part by the Region method
#
shock: begin
shock: variable none
shock: end
shock: create
#
# Now select the newly created shock part
# for subsequent operations
#
part: select_begin
  5
part: select_end

See Also:

Associated shock commands
shock: velocity

**Command:**

```
shock: velocity <variable_name>
```

**Purpose:**

Specify the velocity variable to use in creating/updating a shock part or the default attributes.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the velocity variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

**Notes:**

Since the computation of shock depends on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

**Example Usage:**

```
variables: activate Velocity
shock: select_default
part: modify_begin
shock: velocity Velocity
part: modify_end
```

**See Also:**

Associated shock commands
Commands in this Section:

show_info

show_info: cursor <x-coord> <y-coord> <z-coord>
show_info: element <element_id_number>
show_info: ijk <i-plane_value> <j-plane_value> <k-plane_value>
show_info: node <node_id_number>
show_info: part <part_id_number>

See Also:

User Manual - Section 6.3, Query Menu Functions
How To Get Point, Node, Element, Part Information
show_info: cursor

Command:

show_info: cursor <x-coord> <y-coord> <z-coord>

Purpose:

Show corresponding part and values of all active variables at the specified x, y, z model location.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x-coord</td>
<td>x, y, z locations of the cursor in model coordinates</td>
</tr>
<tr>
<td></td>
<td>y-coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z-coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Used in conjunction with the following commands.

view_transf: function cursor
view_transf: action translate
view_transf: cursor

Example Usage:

```
# # Toggle-on and position the cursor tool
# view_transf: function cursor
tools: cursor ON
view_transf: action translate
view_transf: cursor -1.0000e+00 0.500000 0.500000
# # Revert back to global transformation mode
# view_transf: function global
# # Show part and all active variable information at cursor location
# show_info: cursor -1.0000e+00 0.0000e+00 0.0000e+00
```

Execution of the above example shows the following information in the EnSight Message Window for this dataset:

```
*****************
Point (-1.00000e+00,5.00000e-01,5.00000e-01)(In Frame 0) Query Informa-
tion.
Found in unstructured part # 1.
Found in element # 1698.
Closest node # 1173. (within the element)
Value for Variable temperature is 1.08646e+01.
Values for Variable velocity are:
x=3.64549e-01,y=7.84898e-10,z=2.06609e-02,mag=3.65134e-01.
*****************
```

See Also:

Associated show_info commands
Command:

```
show_info: element <element_id_number>
```

Purpose:

Query/show the associated part connectivity and values of all active variables for the specified element id label.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>element_id_number</td>
<td>a valid element id corresponding to the specified part</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Specify which part
# part: select_begin
1
part: select_end
# from which to show the corresponding element information.
#
show_info: element 20
```

Execution of the above example shows the following information in the EnSight Message Window for this dataset:

```
*****************
Element 20 Query Information.
Found in unstructured part # 1.
Type of element is 8 Noded hexa
Number of nodes is 8
Node IDs are: 6185 6186 6522 6521 6201 6202 6538 6537
Neighboring Element Information is:
Element neighbor 19 is of type 8 Noded hexa
Element neighbor 504 is of type 8 Noded hexa
Element neighbor 21 is of type 8 Noded hexa
Element neighbor 46 is of type 8 Noded hexa
No element based variables active to show values at the element.
*****************
```

See Also:

Associated `show_info` commands
**show_info: ijk**

**Command:**

```
show_info: ijk <i-plane_value> <j-plane_value> <k-plane_value>
```

**Purpose:**

Query/show the associated part connectivity and values of all active variables for the specified i, j, and k location.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>i-plane_value</td>
<td>corresponding i, j, k-plane values</td>
</tr>
<tr>
<td></td>
<td>j-plane_value</td>
<td></td>
</tr>
<tr>
<td></td>
<td>k-plane_value</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

Only applicable for structured parts.

**Example Usage:**

```
#  # Specify the part ...
#  part: select_begin
1
part: select_end
#
# and active variables ...
#
variables: select_varname_begin
  Density
  Energy
  Momentum
  Velo
variables: select_varname_end
#
# at which to show the specified ijk information.
#  show_info: ijk 1 41 1
```

Execution of the above example shows the following information in the EnSight Message Window for this dataset:

```
*************************
IJK 1 41 1 Query Information.
Node id is: 2465.
Found in structured part # 1.
Coordinates (In Frame 0) are: (2.15279e-02,0.00000e+00,-4.94343e-04)
Value for Variable Density is 5.01719e-01.
Value for Variable Energy is 9.46637e-01.
Values for Variable Momentum are:
x=0.00000e+00,y=0.00000e+00,z=0.00000e+00,mag=0.00000e+00.
Values for Variable Velo are:
x=0.00000e+00,y=0.00000e+00,z=0.00000e+00,mag=0.00000e+00.
*************************
```
See Also:

Associated `show_info` commands
show_info: node

Command:

show_info: node <node_id_number>

Purpose:

Query/show the associated part connectivity and values of all active variables for the specified node id label.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>node_id_number</td>
<td>valid node id corresponding to the specified part</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Specify to show the information of node 8000 of part 1
#
part: select_begin
1
part: select_end
show_info: node 8000
```

Execution of the above example shows the following information in the EnSight Message Window for this part:

```
***************
Node 8000 Query Information.
Coordinates (In Frame 0) are: (2.32510e+00,1.66670e-01,8.75000e-01)
Found in unstructured part # 1.
Found in element # 3104.
Found in element # 3105.
Found in element # 3124.
Found in element # 3125.
Found in element # 3588.
Found in element # 3589.
Found in element # 3608.
Found in element # 3609.
Value for Variable temperature is 1.31550e+01.
Values for Variable velocity are:
x=4.87360e-01,y=5.10460e-02,z=-3.70030e-02,mag=4.91421e-01.
***************
```

See Also:

Associated show_info commands
Command:

```
show_info: part <part_id_number>
```

Purpose:

Query/show the associated model information and extent values for the specified part id.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>part_id_number</td>
<td>the part GUI number</td>
</tr>
</tbody>
</table>

Example Usage:

```
# First, select the part ...
#
part: select_begin
1
part: select_end
#
# Then, specify to show its corresponding information.
#
show_info: part 1
```

Execution of the above example shows the following information in the EnSight Message Window for this part:

```
*****************
Part 1 Query Information.
Unstructured part.
Number of nodes 8872
Minimum coordinate(In Frame 0) is (-2.00000e+00,-2.00000e+00,0.00000e+00)
Maximum coordinate(In Frame 0) is (3.00000e+00,3.00000e+00,2.00000e+00)
Element Information is:
Element type: 8 Noded hexa, count = 7512.
*****************
```

See Also:

Associated `show_info` commands
Commands in this Section:

**solution_time**

- `solution_time: #_of_cycles <num>`
- `solution_time: begin_simtime <time>`
- `solution_time: begin_step <step>`
- `solution_time: current_simtime <time>`
- `solution_time: current_step <step>`
- `solution_time: end_simtime <time>`
- `solution_time: end_step <step>`
- `solution_time: increment <step_by>`
- `solution_time: show_as <method>`
- `solution_time: timeset_between <method>`
- `solution_time: timeset_leftof <method>`
- `solution_time: timeset_rightof <method>`
- `solution_time: timeset_select <ts_num>`
- `solution_time: timeset_update`
- `solution_time: update_to_current`
- `solution_time: update_to_first`
- `solution_time: update_to_last`
- `solution_time: update_type <method>`
- `solution_time: zoomout`

**See Also:**

- User Manual - Section 7.13, Solution Time
- How To Change Time Steps
solution_time: #_of_cycles

Command:

solution_time: #_of_cycles <num>

Purpose:

Sets the number of cycles of cyclic transient data. If the first and last time steps represent the same data, one can effectively increase the apparent number of computed time steps, by using this command.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of times to cycle the given transient data (default is 1)</td>
</tr>
</tbody>
</table>

Notes:

This is especially useful for things like pathline generation, (where you can only trace as long as you have transient steps) or transient animation that is synchronized to the data.

Example Usage:

```
# This sets several of the attributes using time steps
# (Including having the data cycle twice)
#
solution_time: begin_step 0
solution_time: end_step 16
solution_time: current_step 0.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 2
solution_time: increment 1.0000e+00
solution_time: show_as step
solution_time: update_type discrete
```

See Also:

Associated solution_time commands
## solution_time: begin/end_simtime

### Command:

```plaintext
solution_time: begin_simtime <time>
solution_time: end_simtime <time>
```

### Purpose:

Sets the solution time to be used as the beginning/ending time for subsequent time use.

### Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time</td>
<td>solution time to use as the beginning/ending time</td>
</tr>
</tbody>
</table>

### Notes:

This is used when the "solution_time: show_as" command is set to "time". Also, it will be truncated to a solution time directly associated with a time step if "solution_time: update_type" is set to "discrete".

Can be greater/lesser or equal to the smallest/largest time available.

### Example Usage:

```plaintext
# This sets several of the attributes using simulation time
#
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
```

### See Also:

Associated `solution_time` commands
solution_time: begin/end_step

**Command:**

```plaintext
solution_time: begin_step <step>  
solution_time: end_step <step>
```

**Purpose:**

Sets the time step to be used as the beginning/ending time step for subsequent time use.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step</td>
<td>time step to use as the beginning/ending time step</td>
</tr>
</tbody>
</table>

**Notes:**

This is used when the "solution_time: show_as" command is set to "step".

Can be greater/lesser or equal to the smallest/largest time step available.

**Example Usage:**

```plaintext
# This sets several of the attributes using time steps

solution_time: show_as step
solution_time: update_type discrete
solution_time: begin_step 0  
solution_time: end_step 16
solution_time: current_step 0
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
```

**See Also:**

Associated solution_time commands
Command:

```plaintext
solution_time: current_simtime <time>
```

Purpose:

Sets the current simulation time. Must be between the beginning time and the ending time.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>time</td>
<td>The simulation time to use as the current time. If &quot;solution_time: update_type&quot; is &quot;continuous&quot;, this can be set to be any time between the beginning and ending times, even if it lies between data points (interpolation will take place). If the &quot;solution_time: update_type&quot; is &quot;discrete&quot;, this should be the time associated with a time step.</td>
</tr>
</tbody>
</table>

Notes:

This is used when the "solution_time: show_as" command is set to "time".

Example Usage:

```plaintext
# This sets several of the attributes using time steps,
# but the current is set 40% between steps 2 and 3.
#
solution_time: show_as step
solution_time: update_type continuous
solution_time: begin_step 0
solution_time: end_step 16
solution_time: current_step 2.4
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
```

See Also:

Associated `solution_time` commands
**solution_time: current_step**

**Command:**

```
solution_time: current_step <step>
```

**Purpose:**

Sets the current time step. Must be between the beginning time step and the ending time step.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int or float</td>
<td>step</td>
<td>The time step to use as the current time step. If &quot;solution_time: update_type&quot; is &quot;continuous&quot;, this can be float and thus can be set to be fractionally between time steps (interpolation will take place). If the &quot;solution_time: update_type&quot; is &quot;discrete&quot;, this should be an integer.</td>
</tr>
</tbody>
</table>

**Notes:**

This is used when the "solution_time: show_as" command is set to "step".

**Example Usage:**

```
# This sets several of the attributes using simulation time
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
```

**See Also:**

Associated `solution_time` commands
Command:

```
solution_time: increment <step_by>
```

Purpose:

Sets the number of steps that are moved when the solution time dialog time stepper buttons are clicked.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>step_by</td>
<td>number of time steps to advance by or decrease by with one click of the solution time stepper buttons</td>
</tr>
</tbody>
</table>

Notes:

This is a user interface attribute.

Example Usage:

```
# This sets several of the attributes using simulation time
# (but at the end it sets the stepper button increment)
#
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
```

See Also:

Associated `solution_time` commands
solution_time: show_as

Command:

    solution_time: show_as <method>

Purpose:

Sets method to use for specifying time - either as solution time directly or as time steps of data.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>step to use time steps. Inherently this is discrete in nature, equal to the number of discrete times that data is given. EnSight can however deal with fractional time steps by interpolating between them.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>time to use simulation time directly. This will also cause interpolation to occur if a time is specified which is not at the time associated with a time step.</td>
</tr>
</tbody>
</table>

Example Usage:

```
# This sets several of the attributes using simulation time
#
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
#
# But here we change it to use time steps
#
solution_time: show_as step
solution_time: update_type discrete
solution_time: begin_step 0
solution_time: end_step 16
solution_time: current_step 5
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
```

See Also:

Associated solution_time commands
**Command:**

```
solution_time: timeset_between <method>
```

**Purpose:**

When the current time lies between the steps of a given timeset, this command sets how to handle the situation in the span.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>undefined</td>
<td>when between steps, treat the variable as undefined</td>
</tr>
<tr>
<td></td>
<td>interpolate</td>
<td>when between steps, interpolate the variable value from the left and right steps</td>
</tr>
<tr>
<td></td>
<td>nearest</td>
<td>when between steps, use the variable value at the nearest step</td>
</tr>
<tr>
<td></td>
<td>left</td>
<td>when between steps, use the variable value at the step to the left</td>
</tr>
<tr>
<td></td>
<td>right</td>
<td>when between steps, use the variable values at the step to the right</td>
</tr>
</tbody>
</table>

**Notes:**

The geometry and each variable can be specified according to its own timeset, with different beginning and ending times and number of steps. These timesets are combined into the solution time range in the solution dialog. But, with this general capability comes the need to know what to do when a current time lies outside the extents of, or between the steps of a given timeset.

**Example Usage:**

```
# Selecting the timeset
#
solution_time: timeset_select 2
#
# Setting the timeset span handling methods
# (Note that we will interpolate if between)
#
solution_time: timeset_leftof undefined
solution_time: timeset_between interpolate
solution_time: timeset_rightof nearest
#
# Update timesets and model display
#
solution_time: timeset_update
```

**See Also:**

Associated `solution_time` commands
solution_time: timeset_leftof

Command:

solution_time: timeset_leftof <method>

Purpose:

When the current time lies before the beginning step of a given timeset, this command sets how to handle the situation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>undefined when before beginning step, treat the variable as undefined</td>
</tr>
<tr>
<td></td>
<td>nearest</td>
<td>when before beginning step, use the variable value at the nearest step</td>
</tr>
</tbody>
</table>

Notes:

The geometry and each variable can be specified according to its own timeset, with different beginning and ending times and number of steps. These timesets are combined into the solution time range in the solution dialog. But, with this general capability comes the need to know what to do when a current time lies outside the extents of, or between the steps of a given timeset.

Example Usage:

```plaintext
# Selecting the timeset
solution_time: timeset_select 2
# Setting the timeset span handling methods
# (Note that we will treat as undefined if left of)
# solution_time: timeset_leftof undefined
solution_time: timeset_between interpolate
solution_time: timeset_rightof nearest
# Update timesets and model display
solution_time: timeset_update
```

See Also:

Associated solution_time commands
Command:

solution_time: timeset_rightof <method>

Purpose:

When the current time lies after the ending step of a given timeset, this command sets how to handle the situation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>undefined after the ending step, treat the variable as undefined</td>
</tr>
<tr>
<td></td>
<td>nearest</td>
<td>nearest after the ending step, use the variable value at the nearest step</td>
</tr>
</tbody>
</table>

Notes:

The geometry and each variable can be specified according to its own timeset, with different beginning and ending times and number of steps. These timesets are combined into the solution time range in the solution dialog. But, with this general capability comes the need to know what to do when a current time lies outside the extents of, or between the steps of a given timeset.

Example Usage:

```
# Selecting the timeset
solution_time: timeset_select 2

# Setting the timeset span handling methods
# (Note that we will treat as nearest if right of)

solution_time: timeset_leftof undefined
solution_time: timeset_between interpolate
solution_time: timeset_rightof nearest

# Update timesets and model display
solution_time: timeset_update
```

See Also:

Associated solution_time commands
solution_time: timeset_select

Command:

\[
\text{solution_time}: \text{timeset\_select} \ <\text{ts\_num}> \\
\]

Purpose:

Selects the timeset to modify.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>ts_num</td>
<td>timeset number</td>
</tr>
</tbody>
</table>

Notes:

The geometry and each variable can be specified according to its own timeset, with different beginning and ending times and number of steps. These timesets are combined into the solution time range in the solution dialog. But, with this general capability comes the need to know what to do when a current time lies outside the extents of, or between the steps of a given timeset.

Example Usage:

```
#  # Selecting the timeset
#  solution_time: timeset_select 2
#  # Setting the timeset span handling methods
#  # (Note that we will treat as nearest if right of)
#  solution_time: timeset_leftof undefined
solution_time: timeset_between interpolate
solution_time: timeset_rightof nearest
#  # Update timesets and model display
#  solution_time: timeset_update
```

See Also:

Associated solution_time commands
Command:

```
solution_time: timeset_update
```

Purpose:

Updates the selected timeset and any associated display of the model according to the span handling methods specified.

Parameters:

none

Notes:

The geometry and each variable can be specified according to its own timeset, with different beginning and ending times and number of steps. These timesets are combined into the solution time range in the solution dialog. But, with this general capability comes the need to know what to do when a current time lies outside the extents of, or between the steps of a given timeset.

Example Usage:

```
# Selecting the timeset
solution_time: timeset_select 2

# Setting the timeset span handling methods
# (Note that we will treat as nearest if right of)
solution_time: timeset_leftof undefined
solution_time: timeset_between interpolate
solution_time: timeset_rightof nearest

# Update timesets and model display
solution_time: timeset_update
```

See Also:

Associated `solution_time` commands
solution_time: update_to_current

Command:

```
solution_time: update_to_current
```

Purpose:

Causes the display and all associated computations of the model to be updated to the currently specified time or step.

Parameters:

none

Example Usage:

```
# This sets several of the attributes using simulation time
#
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
#
# But here we change it to use time steps
#
solution_time: show_as step
solution_time: update_type discrete
solution_time: begin_step 0
solution_time: end_step 16
solution_time: current_step 5
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
```

See Also:

Associated `solution_time` commands
Command:

`solution_time: update_to_first`

Purpose:

Causes the display and all associated computations of the model to be updated to the first time or step of the model.

Parameters:

none

Notes:

This command is not generated by the EnSight GUI, but is intended for use with batch or context operations where the time of the first step could vary from model to model.

Example Usage:

`solution_time: update_to_first`

See Also:

Associated `solution_time` commands
solution_time: update_to_last

Command:

solution_time: update_to_last

Purpose:

Causes the display and all associated computations of the model to be updated to the last time or step of the model.

Parameters:

none

Notes:

This command is not generated by the EnSight GUI, but is intended for use with batch or context operations where the time of the last step could vary from model to model.

Example Usage:

solution_time: update_to_last

See Also:

Associated solution_time commands
solution_time: update_type

Command:

`solution_time: update_type <method>`

Purpose:

Sets whether times or time steps can be specified between the data steps in the model, thus causing interpolation to be needed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>discrete no in-between steps or times can be specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>continuous fractional time steps or simulation times not at a step can be specified</td>
</tr>
</tbody>
</table>

Notes:

This command and "solution_time: show_as" combine to control whether interpolation will be needed.

Example Usage:

```
# This sets several of the attributes using simulation time
#
solution_time: show_as time
solution_time: update_type continuous
solution_time: begin_simtime 0.0000e+00
solution_time: end_simtime 1.6000e+01
solution_time: current_simtime 9.0000e+00
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 2.0000e+00
#
# But here we change it to use time steps
#
solution_time: show_as step
solution_time: update_type discrete
solution_time: begin_step 0
solution_time: end_step 16
solution_time: current_step 5
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
```

See Also:

Associated `solution_time` commands
**solution_time: zoomout**

**Command:**

```
solution_time: zoomout
```

**Purpose:**

Resets the begin and end steps (or begin and end simtimes) to the widest possible settings.

**Parameters:**

none

**Notes:**

This may be desirable after one has modified (narrowed) the begin and end steps or time for a given temporary purpose.

**Example Usage:**

```
solution_time: show_as step
solution_time: update_type discrete
solution_time: begin_step 3
solution_time: end_step 12
solution_time: current_step 5
solution_time: update_to_current
solution_time: #_of_cycles 1
solution_time: increment 1.0000e+00
#
# One could load a flipbook or something like
# that at this point, using the narrowed range
# of 3 to 12. Then could use the next command
# to get the range back to 0 to 16
#
solution_time: zoomout
```

**See Also:**

Associated `solution_time` commands
Commands in this Section:

subset

subset: begin
subset: end
subset: begin_subsetdesc
subset: end_subsetdesc
subset: create
subset: select_default

See Also:

User Manual - Section 7.16, Subset Parts Create/Update
How To Create Subset Parts
Command:

```plaintext
subset: begin
<subset_commands>
subset: end
```

Purpose:

Delimit the modifications for subset part attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>subset_commands</td>
<td>any of the subset attribute commands</td>
</tr>
</tbody>
</table>

Notes:

These commands are used to set the attributes for a subset part creation.

Example Usage:

```plaintext
subset: begin
subset: begin_subsetdesc
part_num 1
nodes
1-10
elements
20-30
subset: end_subsetdesc
subset: end
subset: create
```

See Also:

Associated `subset` commands
Command:

```command
subset: begin_subsetdesc
part_num <num>
nodes
<nodes_string>
elements
<elements_string>
subset: end_subsetdesc
```

Purpose:

Encloses the information for parent part number, nodes, and elements for a subset part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>Parent part number of the subset part. Place it on the line with the keyword &quot;part_num&quot;, as shown in the example.</td>
</tr>
<tr>
<td>string</td>
<td>nodes_string</td>
<td>List of nodes to include in the subset part. Place the keyword &quot;nodes&quot; on a line, then place this string on subsequent lines. Note that the list is a comma separated list of node ids which can also include dash separated ranges of nodes.</td>
</tr>
<tr>
<td>string</td>
<td>elements_string</td>
<td>List of elements to include in the subset part. Place the keyword &quot;elements&quot; on a line, then place this string on subsequent lines. Note that the list is a comma separated list of element ids which can also include dash separated ranges of elements.</td>
</tr>
</tbody>
</table>

Example Usage:

```command
subset: begin
subset: begin_subsetdesc
part_num 1
nodes
13,1-10,103,104,200-3000
elements
20-30,100-200,355
subset: end_subsetdesc
subset: end
subset: create
```

See Also:

Associated `subset` commands
subset: create

**Command:**

    subset: create

**Purpose:**

Creates a subset part according to previously defined attributes or defaults.

**Parameters:**

none

**Example Usage:**

```
subset: begin
subset: begin_subsetdesc
part_num 1
nodes
13,1-10,103,104,200-3000
elements
20-30,100-200,355
subset: end_subsetdesc
subset: end
subset: create
```

**See Also:**

Associated subset commands
**Command:**

```
subset: select_default
```

**Purpose:**

Sets to default subset part, so subsequent attribute changes will apply to the defaults.

**Parameters:**

none

**Example Usage:**

```
subset: select_default
part: modify_begin
part: colorby_rgb 6.0000e-01 0.0000e+00 1.0000e+00
part: modify_end
```

**See Also:**

Associated `subset` commands
subset: select_default
Commands in this Section:

tensor

tensor: begin
tensor: end
tensor: color_by <method>
tensor: compression_line_width <width>
tensor: compression_rgb <red_val> <grn_val> <blu_val>
tensor: create
tensor: display_compression <toggle>
tensor: display_major <toggle>
tensor: display_middle <toggle>
tensor: display_minor <toggle>
tensor: display_tension <toggle>
tensor: line_width_by <method>
tensor: scale_factor <value>
tensor: select_default
tensor: tension_line_width <width>
tensor: tension_rgb <red_val> <grn_val> <blu_val>
tensor: tip_shape <shape>
tensor: tip_size <size>
tensor: variable <name>

See Also:

User Manual - Section 7.17, Tensor Glyph Parts Create/Update
How To Create Tensor Glyphs
Command:

tensor: begin
	<tensor_command>
	<tensor_command>
	. .
	<tensor_command>
tensor: end

Purpose:

Delimit the modifications for tensor parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>tensor_command</td>
<td>any of the tensor attribute commands</td>
</tr>
</tbody>
</table>

Notes:

These commands are used to set the attributes for tensor glyph part creation.

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor

# Selecting all parts as parents
part: select_all

# Grouping a bunch of tensor attribute commands

tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by_direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by_direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end

# Creating the tensor glyph part

tensor: create
```

See Also:

Associated tensor commands
Command:

```
tensor: color_by <method>
```

**Purpose:**

Sets the method by which a tensor glyph part is colored.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>part</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tensor glyph part will be colored according to the &quot;part: colorby_rgb&quot; command, just as any other part</td>
</tr>
<tr>
<td></td>
<td>direction</td>
<td>tensor glyph part will be colored by the rgb values set for tension and compression using the &quot;tensor: tension_rgb&quot; and &quot;tensor: compression_rgb&quot; commands</td>
</tr>
</tbody>
</table>

**Example Usage:**

```lua
#
# Activating a tensor variable
#
variables: activate uniaxial_tensor
#
# Selecting all parts as parents
#
part: select_all
#
# Grouping a bunch of tensor attribute commands
#
tensor: begin
  tensor: variable uniaxial_tensor
  tensor: display_compression ON
  tensor: display_tension ON
  tensor: display_major ON
  tensor: display_minor ON
  tensor: display_middle ON
  tensor: tip_shape triangle
  tensor: tip_size 1.0000e-01
  tensor: color_by direction
  tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
  tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
  tensor: line_width_by direction
  tensor: compression_line_width 2
  tensor: tension_line_width 4
  tensor: end
#
# Creating the tensor glyph part
#
tensor: create
#
# Now selecting the tensor glyph part
#
part: select_begin
  5
part: select_end
```
tensor: color_by

# And changing to color by part instead of direction
#
part: modify_begin
tensor: color_by part
part: modify_end

See Also:

Associated tensor commands
Command:

```
tensor: compression_line_width <width>
```

Purpose:

Sets the line width (in pixels) that will be used for the compression portion of a tensor glyph if the "tensor: line_width_by" command method is set to "direction".

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>width in pixels for the compression portion of a tensor glyph (range is 1 to 4)</td>
</tr>
</tbody>
</table>

Notes:

If the "tensor: line_width_by" command method is set to "part", the tensor glyph part is line width is set in the same manner as any other part.

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor

# Selecting all parts as parents
part: select_all

# Grouping a bunch of tensor attribute commands
# (included is the one to make compression lines 2 pixels wide)
# tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end

# Creating the tensor glyph part
# tensor: create
```

See Also:

Associated tensor commands
**tensor: compression_rgb**

**Command:**

```
tensor: compression_rgb <red_val> <grn_val> <blu_val>
```

**Purpose:**

Sets the color that will be used for the compression portion of a tensor glyph if the "tensor: color_by" command method is set to "direction".

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components for the compression line (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

If the "tensor: color_by" command method is set to "part", the tensor glyph part is colored like any other part.

**Example Usage:**

```
# # Activating a tensor variable
# variables: activate uniaxial_tensor
# # Selecting all parts as parents
# # part: select_all
# # Grouping a bunch of tensor attribute commands
# (included is the one to make compression lines a particular color)
# tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# # Creating the tensor glyph part
# tensor: create
```

**See Also:**

Associated tensor commands
Command:

```
tensor: create
```

Purpose:

Causes a tensor glyph part to be created according to previously set attributes or defaults.

Parameters:

none

Notes:

The selection of parent part(s) is required.

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor
# Selecting all parts as parents
part: select_all
# Grouping a bunch of tensor attribute commands
# tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# Creating the tensor glyph part
# tensor: create
```

See Also:

Associated tensor commands
**tensor: display_compression**

**Command:**

```plaintext
tensor: display_compression <toggle>
```

**Purpose:**

Specifies whether the compression portion of a tensor glyph will be displayed or not.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to have the compression portion of the glyph displayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to have the compression portion of the glyph displayed</td>
</tr>
</tbody>
</table>

**Example Usage:**

```plaintext
# Activating a tensor variable
variables: activate uniaxial_tensor
#
# Selecting all parts as parents
#
part: select_all
#
# Grouping a bunch of tensor attribute commands
# (One of which is to have the compression displayed)
#
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
#
# Creating the tensor glyph part
#
tensor: create
#
# Selecting the newly created tensor glyph part
#
part: select_begin
5
part: select_end
#
# And turning compression portion off - to
# show how it can be done
#
part: modify_begin
 tensor: display_compression OFF
```
See Also:

Associated tensor commands
tensor: display major/middle/minor

Command:

```
tensor: display_major <toggle>
tensor: display_middle <toggle>
tensor: display_minor <toggle>
```

Purpose:

Specifies whether the major, middle, or minor eigenvectors of a tensor glyph will be displayed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to have the specified eigenvector of the glyph displayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to not have the specified eigenvector of the glyph displayed</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor
# Selecting all parts as parents
part: select_all
# Grouping a bunch of tensor attribute commands
# (Note that all eigenvectors are set to be displayed)
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# Creating the tensor glyph part
tensor: create
# Selecting the newly created tensor glyph part
part: select_begin
5
part: select_end
# And turning off the middle eigenvector
```
#
part: modify_begin
tensor: display_middle OFF
part: modify_end

See Also:

Associated tensor commands
tensor: display_tension

Command:

tensor: display_tension <toggle>

Purpose:

Specifies whether the tension portion of a tensor glyph will be displayed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to have the tension portion of the glyph displayed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to not have the tension portion of the glyph displayed</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor
#
# Selecting all parts as parents
#
part: select_all
#
# Grouping a bunch of tensor attribute commands
# (One of which is to have the tension displayed)
#
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
#
# Creating the tensor glyph part
#
tensor: create
#
# Selecting the newly created tensor glyph part
#
part: select_begin
5
part: select_end
#
# And turning tension portion off - to
# show how it can be done
#
part: modify_begin
tensor: display_tension OFF
```
part: modify_end

See Also:

Associated tensor commands
tensor: line_width_by

Command:

tensor: line_width_by <method>

Purpose:

Sets the method by which a tensor glyph part’s line width is controlled.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td>part</td>
</tr>
<tr>
<td>direction</td>
<td></td>
<td>tensor glyph part’s line width will be set just as any other part</td>
</tr>
<tr>
<td>direction</td>
<td></td>
<td>tensor glyph part’s line width will be set by the &quot;tensor: compression_line_width&quot; and &quot;tensor: tension_line_width&quot; command values</td>
</tr>
</tbody>
</table>

Example Usage:

```
# # Activating a tensor variable
# variables: activate uniaxial_tensor
# # Selecting all parts as parents
# part: select_all
# # Grouping a bunch of tensor attribute commands
# # (Note line width set by direction)
# # tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# # Creating the tensor glyph part
# tensor: create
# # Now selecting the tensor glyph part
# part: select_begin
5
part: select_end
# ```
# And changing to line width to be by part instead of direction
#
part: modify_begin
tensor: line_width_by part
part: modify_end

See Also:

Associated tensor commands
**Command:**

tensor: scale_factor <value>

**Purpose:**

Sets the scale factor to be applied to the tensor glyph.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>the scale factor that to apply to the tensor glyph</td>
</tr>
</tbody>
</table>

**Notes:**

The factor is applied to major, middle, and minor eigenvectors.

**Example Usage:**

```plaintext
# Activating a tensor variable
variables: activate uniaxial_tensor
# Selecting all parts as parents
part: select_all
# Grouping a bunch of tensor attribute commands
# (One of which is the scale factor)
# tensor: begin
tensor: variable uniaxial_tensor
tensor: scale_factor 1.6700e+00
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# Creating the tensor glyph part
# tensor: create
# Now selecting the tensor glyph part
part: select_begin
5
part: select_end
# And changing the scale factor back to 1
```
part: modify_begin
  tensor: scale_factor 1.0000e+00
part: modify_end

See Also:

Associated tensor commands
tensor: select_default

Command:

tensor: select_default

Purpose:
Sets default as the current tensor glyph selection, so subsequent attribute modifications will affect
the default.

Parameters:
none

Notes:
When certain attributes will be common to future tensor glyph parts, it is useful to set these once
as the default.

Example Usage:

#  # Setting to default
#  tensor: select_default
#  # Setting a few things as defaults
#  part: modify_begin
tensor: scale_factor 1.5000e+00
tensor: display_middle OFF
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 0.0000e+00
tensor: tension_rgb 0.0000e+00 0.0000e+00 1.0000e+00
tensor: line_width_by part
part: modify_end

See Also:
Associated tensor commands
Command:

tensor: tension_line_width <width>

Purpose:

Sets the line width (in pixels) that will be used for the tension portion of a tensor glyph if the "tensor: line_width_by" command method is set to "direction".

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>width in pixels for the tension portion of a tensor glyph (range is 1 to 4)</td>
</tr>
</tbody>
</table>

Notes:

If the "tensor: line_width_by" command method is set to "part", the tensor glyph part line width is set in the same manner as any other part.

Example Usage:

```
# # Activating a tensor variable
# variables: activate uniaxial_tensor
# # Selecting all parts as parents
# part: select_all
# # Grouping a bunch of tensor attribute commands
# (included is the one to make tension lines 4 pixels wide)
# tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# # Creating the tensor glyph part
# tensor: create
```

See Also:

Associated tensor commands
tensor: tension_rgb

Command:

    tensor: tension_rgb <red_val> <grn_val> <blu_val>

Purpose:

Sets the color that will be used for the tension portion of a tensor glyph if the "tensor: color_by" command method is set to "direction".

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components for the tension line (0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

If the "tensor: color_by" command method is set to "part", the tensor glyph part is colored like any other part.

Example Usage:

```plaintext
# # Activating a tensor variable
# variables: activate uniaxial_tensor
# # Selecting all parts as parents
# part: select_all
# # Grouping a bunch of tensor attribute commands
# (included is the one to make tension lines a particular color)
# # tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# # Creating the tensor glyph part
# tensor: create
```

See Also:

Associated tensor commands
Command:

tensor: tip_shape <shape>

Purpose:

Sets the shape of the tips on the tensor glyphs

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>shape</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>glyphs will have no tips</td>
</tr>
<tr>
<td></td>
<td></td>
<td>normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>glyphs will have typical 2-line arrowheads</td>
</tr>
<tr>
<td></td>
<td></td>
<td>triangle</td>
</tr>
<tr>
<td></td>
<td></td>
<td>glyphs will have triangular arrowheads</td>
</tr>
</tbody>
</table>

Notes:

The direction of the arrowheads will be towards each for compression and away from each other for tension.

Example Usage:

```plaintext
# Activating a tensor variable
# variables: activate uniaxial_tensor
# # Selecting all parts as parents
# part: select_all
# # Grouping a bunch of tensor attribute commands
# (included is the one to make triangle arrowhead tips)
#
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
# # Creating the tensor glyph part
# tensor: create
```

See Also:

Associated tensor commands
Command:

\texttt{tensor: tip\_size <size>}

Purpose:

Sets the size of the tips on the tensor glyphs

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>a relative size factor for tensor glyph tips</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Activating a tensor variable
# variables: activate uniaxial_tensor
# Selecting all parts as parents
# part: select_all
# Grouping a bunch of tensor attribute commands
# (included is the one to set tip size)
#
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
#
# Creating the tensor glyph part
#
tensor: create
```

See Also:

Associated tensor commands
Command:

tensor: variable <name>

Purpose:

Specifies the name of the tensor variable that the tensor glyphs will represent.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>name of the tensor variable</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Activating a tensor variable
variables: activate uniaxial_tensor
#
# Selecting all parts as parents
#
part: select_all
#
# Grouping a bunch of tensor attribute commands
# (included the one that specifies the name)
#
tensor: begin
tensor: variable uniaxial_tensor
tensor: display_compression ON
tensor: display_tension ON
tensor: display_major ON
tensor: display_minor ON
tensor: display_middle ON
tensor: tip_shape triangle
tensor: tip_size 1.0000e-01
tensor: color_by direction
tensor: compression_rgb 1.0000e+00 0.0000e+00 4.0000e-01
tensor: tension_rgb 0.0000e+00 8.0000e-01 1.0000e+00
tensor: line_width_by direction
tensor: compression_line_width 2
tensor: tension_line_width 4
tensor: end
#
# Creating the tensor glyph part
#
tensor: create
```

See Also:

Associated tensor commands
tensor: variable
Commands in this Section:

text

  text: change_text <revised_text>
  text: delete
  text: justification <justification_type>
  text: location_x <coord>
  text: location_y <coord>
  text: modify_begin
  text: modify_end
  text: new_text <text>
  text: relative_viewport <viewport>
  text: rgb <red_val> <grn_val> <blu_val>
  text: rotational_angle <angle>
  text: select_all
  text: select_begin
  text: select_end
  text: select_default
  text: size <size>
  text: visible <toggle>

See Also:

  User Manual - Section 8.2, Annot Mode
  How To Create Text Annotation
text: change_text

Command:

```
text: change_text  <revised_text>
```

Purpose:

Replaces the currently selected annotation text.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>revised_text</td>
<td>desired revised text</td>
</tr>
</tbody>
</table>

Example Usage:

```
text: select_begin
1
text: select_end
text: change_text
this is the revised text!
```

See Also:

Associated text commands
Command:

    text: delete

Purpose:

    Deletes the currently selected text in the graphics window.

Parameters:

    none

Example Usage:

    text: select_begin
    1 2 3
    text: select_end
    text: delete

See Also:

    Associated text commands
Command:

```
justification <justification_type>
```

Purpose:

Specifies the placement of the selected text in the graphics window, in relation to the point specified in the `location_x` and `location_y` commands.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>justification_type</td>
<td>Must have one of the following values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>left</td>
</tr>
<tr>
<td></td>
<td></td>
<td>center</td>
</tr>
<tr>
<td></td>
<td></td>
<td>right</td>
</tr>
</tbody>
</table>

Notes:

The default value for justification is left.

Also denotes the point about which the text rotates.

Example Usage:

```
select_begin
1
select_end
location_x 0.5
location_y 0.6
justification left
```

See Also:

Associated `text` commands
Command:

```
text: location_x <coord>
text: location_y <coord>
```

Purpose:

Specifies the x/y coordinate of the selected text in the currently selected viewport.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>coord</td>
<td>A value of 0.0 indicates the left/bottom side of the window, while a value of 1.0 indicates the right/top side.</td>
</tr>
</tbody>
</table>

Notes:

The text position can also be in reference to a specific viewport.

See "text: relative_viewport" command.

Example Usage:

```
text: select_begin
  1
text: select_end
text: relative_viewport 2
text: location_x 0.5
text: location_y 0.5
text: justification center
```

See Also:

Associated text commands
**Command:**

```plaintext
text: modify_begin
text: modify_end
```

**Purpose:**

Delimit the modifications for text attributes.

**Notes:**

These optional commands can be used to execute a number of attribute changes at one time for better performance.

**Parameters:**

none

**Example Usage:**

```plaintext
text: select_begin
l
text: select_end
text: modify_begin
text: rgb 1 0 0
text location_x 100
text location_y 20
text modify_end
```

**See Also:**

Associated text commands
Command:

```
text: new_text  <text>
```

Purpose:

Creates new text in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>text</td>
<td>desired text</td>
</tr>
</tbody>
</table>

Example Usage:

```
text: new_text This is the new text!
text: location_x  0.5
text: location_y  0.6
```

See Also:

Associated text commands
text: relative_viewport

Command:

`text: relative_viewport <viewport>`

Purpose:

Specifies the viewport to which location of the selected text will be relative, when specified by the `text: location_x` and `location_y` commands.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>viewport</td>
<td>specifies the viewport</td>
</tr>
</tbody>
</table>

Notes:

A value of zero indicates the graphics window.

Example Usage:

```
text: select_begin
1
text: select_end

text: relative_viewport 0

text: location_x 0.5

text: location_y 0.6
```

See Also:

Associated text commands
Command:

```
  text: rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Specifies the RGB color value of the selected text in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components, (0.0 to 1.0).</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
  text: select_begin
  1
  text: select_end
  text: rgb 1.0 0 0
```

See Also:

Associated text commands
text: rotational_angle

Command:

```
text: rotational_angle <angle>
```

Purpose:

Specifies the angle of rotation of the selected text in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>angle</td>
<td>must be within the range of 0.0 to 360.0</td>
</tr>
</tbody>
</table>

Notes:

A value of 0 for rotation corresponds to the normal, upright orientation of text, with clockwise rotation at higher values.

The text rotates about the justification point.

Example Usage:

```
text: select_begin
1
```

```
text: select_end
```

```
text: rotational_angle 45.0
```

See Also:

Associated text commands
**Command:**

```
text: select_all
```

**Purpose:**

Selects all of the defined text annotations as the target for future text commands.

**Parameters:**

- none

**Example Usage:**

```
text: select_all
text: delete
```

**See Also:**

Associated text commands
text: select_begin/end

Command:

    text: select_begin
    <index1  index2 ... indexN>
    text: select_end

Purpose:

Selects one or more text strings in the graphics window as the target for future text: commands

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>indexN</td>
<td>The text annotation ID</td>
</tr>
</tbody>
</table>

Example Usage:

    text: select_begin
    1 2
    text: select_end
    text: rgb 1 0 0

See Also:

Associated text commands
Command:

```
text: select_default
```

Purpose:

Causes any following text commands to affect the default settings, rather than a particular text object.

Parameters:

none

Notes:

All text commands following `text: select_default` will affect default settings until a new text object is selected using `text: select_begin/select_end`.

Example Usage:

```
text: select_default
text: visible OFF
text: rgb 1 0 0
text: select_begin
1
text: select_end
```

See Also:

Associated text commands
text: size

Command:

```
text: size <size>
```

Purpose:

Specifies the size of the selected text in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>size</td>
<td>must be within the range of 0 to 100</td>
</tr>
</tbody>
</table>

Notes:

Text size is specified in arbitrary units, with 0 being the smallest possible text and 100 the largest.

The text scales with the size of the graphics window.

Example Usage:

```
text: select_begin
1
text: select_end
text: size 25
```

See Also:

Associated text commands
Command:

```
text: visible <toggle>
```

Purpose:

Controls the visibility of the selected text in the graphics window.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: annotation is visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: annotation is not visible</td>
</tr>
</tbody>
</table>

Notes:

Text is visible by default.

Example Usage:

```
text: select_begin
1
1
1
1
text: select_end

text: visible ON
```

See Also:

Associated text commands
Commands in this Section:

**tools**

- tools: box <option>
- tools: cursor <toggle>
- tools: line <toggle>
- tools: plane <option>
- tools: quadric <option>

**See Also:**

- User Manual - Section 6.5, Tools Menu Functions
- How To Use the Cursor (Point) Tool
- How To Use the Line Tool
- How To Use the Plane Tool
- How To Use the Cylinder Tool
- How To Use the Sphere Tool
- How To Use the Cone Tool
- How To Use the Surface of Revolution Tool
tools: box

Command:

   tools: box <option>

Purpose:

Turns the box tool on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turn the box tool on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turn the box tool off</td>
</tr>
</tbody>
</table>

Example Usage:

   tools: box ON

See Also:

Associated tools commands
Command:

```plaintext
tools: cursor <toggle>
```

Purpose:

Turns the cursor tool on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
tools: cursor ON
```

See Also:

Associated tools commands
tools: line

Command:

    tools: line <toggle>

Purpose:

    Turns the line tool on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Example Usage:

    tools: line ON

See Also:

    Associated tools commands
Command:

tools: plane <option>

Purpose:

Turns the plane tool on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>turn the tool on using last representation</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>turn the tool off</td>
</tr>
<tr>
<td></td>
<td>LINE</td>
<td>turn the tool on and drawn with lines</td>
</tr>
<tr>
<td></td>
<td>FILLED</td>
<td>turn the tool on and draw filled</td>
</tr>
</tbody>
</table>

Example Usage:

`tools: plane ON`

See Also:

Associated tools commands
tools: quadric

Command:

    tools: quadric <option>

Purpose:

turns the quadric tool on or off.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>CYLINDER turns the cylinder tool visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SPHERE turn the sphere tool visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CONE turn the cone tool visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>REVOLUTION turn the surface of revolution tool visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>NONE turn the quadric tool invisible</td>
</tr>
</tbody>
</table>

Example Usage:

    tools: quadric SPHERE

See Also:

Associated tools commands
Commands in this Section:

varextcfld

varextcfld: density <var>
varextcfld: freestream_density <dens>
varextcfld: freestream_mach <num>
varextcfld: freestream_speed_sound <num>
varextcfld: gas_constant <num>
varextcfld: modify_begin
varextcfld: modify_end
varextcfld: momentum <var>
varextcfld: ratio_of_specific_heat <var or num>
varextcfld: show_extended <toggle>
varextcfld: total_energy <var>
varextcfld: velocity <var>

See Also:

User Manual - Section 4.1, Variable Selection and Activation
User Manual - Section 4.3, Variable Creation
How To Create New Variables
varextcfd: density

Command:

varextcfd: density <var>

Purpose:

Set the density basis variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var</td>
<td>name of the density variable</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```
# Activating all variables in this case
variables: activate_all
#
# Making extended variables available
#
varextcfd: show_extended ON
#
# Setting the basis variables and constants
#
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
Command:

varextcfd: freestream_density <dens>

Purpose:

Set the freestream density constant.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>dens</td>
<td>desired value of the freestream density constant</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
varextcfd: freestream_mach

Command:

varextcfd: freestream_mach <num>

Purpose:

Set the freestream mach number constant.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>desired value of the freestream mach number constant</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```#
# Activating all variables in this case
# variables: activate_all
# # Making extended variables available
# varextcfd: show_extended ON
# # Setting the basis variables and constants
# varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
Command:

```
varextcfd: freestream_speed_sound <num>
```

Purpose:

Set the freestream speed of sound constant.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>desired value of the freestream speed of sound constant</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```
# Activating all variables in this case
variables: activate_all
#
# Making extended variables available
#
varextcfd: show_extended ON
#
# Setting the basis variables and constants
#
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated `varextcfd` commands
varextcfd: gas_constant

Command:

varextcfd: gas_constant <num>

Purpose:

Set the gas constant.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>num</td>
<td>desired value of the gas constant</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```#
# Activating all variables in this case
#
varextcfd: activate_all
#
# Making extended variables available
#
varextcfd: show_extended ON
#
# Setting the basis variables and constants
#
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end```

See Also:

Associated varextcfd commands
Command:

```
varextcfd: modify_begin
<varextcfd_command>
<varextcfd_command>
.. 
..<varextcfd_command>
varextcfd: modify_end
```

Purpose:

Delimit the modifications to the extended CFD attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>varextcfd_command</td>
<td>any of the varextcfd commands</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

These are optional commands which increase performance since all changes are made at one time.

Example Usage:

```
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated `varextcfd` commands
varextcfd: momentum

Command:

varextcfd: momentum <var>

Purpose:

Set the momentum basis variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var</td>
<td>name of the momentum variable</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined. You must define either momentum or velocity for a basis, but not both.

Example Usage:

```plaintext
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
varextcfd: ratio_of_specific_heat

Command:

varextcfd: ratio_of_specific_heat <var or num>

Purpose:

Set the ratio of specific heat basis variable, or constant.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string or float</td>
<td>var or num</td>
<td>name of the ratio of specific heat variable, or the value to use as a constant</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```plaintext
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
varextcfd: show_extended

Command:

varextcfd: show_extended <toggle>

Purpose:

Make extended CFD variables available or not.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to make extended CFD variables available</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to make them unavailable.</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined. Once the basis variables and constants are defined, and this command makes them available - the variables can be computed when activated or used.

Example Usage:

```
# Activating all variables in this case
variables: activate_all
# Making extended variables available
# varextcfd: show_extended ON
# Setting the basis variables and constants
# varextcfd: modify_begin
varextcfd: density Density
varextcfd: momentum Momentum
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated varextcfd commands
Command:

\texttt{varextcfd: total\_energy <var>}

Purpose:

Set the \texttt{total\_energy} basis variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>\texttt{var}</td>
<td>name of the \texttt{total_energy} variable</td>
</tr>
</tbody>
</table>

Notes:

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined.

Example Usage:

```plaintext
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
dataextcfd: momentum Momentum
dataextcfd: total\_energy Energy
dataextcfd: ratio\_of\_spec\_heat 1.4000e+00
dataextcfd: freestream\_mach 1.0000e+00
dataextcfd: gas\_constant 1.0000e+00
dataextcfd: freestream\_density 1.0000e+00
dataextcfd: freestream\_speed\_sound 1.0000e+00
varextcfd: modify_end
```

See Also:

Associated \texttt{varextcfd} commands
varextcfd: velocity

**Command:**

varextcfd: velocity <var>

**Purpose:**

Set the velocity basis variable.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var</td>
<td>name of the velocity variable</td>
</tr>
</tbody>
</table>

**Notes:**

For extended CFD variables to be computed, the basis variables must be identified and the basis constants defined. You must define either momentum or velocity for a basis, but not both.

**Example Usage:**

```plaintext
# Activating all variables in this case
variables: activate_all
# Making extended variables available
varextcfd: show_extended ON
# Setting the basis variables and constants
varextcfd: modify_begin
varextcfd: density Density
varextcfd: velocity Velocity
varextcfd: total_energy Energy
varextcfd: ratio_of_spec_heat 1.4000e+00
varextcfd: freestream_mach 1.0000e+00
varextcfd: gas_constant 1.0000e+00
varextcfd: freestream_density 1.0000e+00
varextcfd: freestream_speed_sound 1.0000e+00
varextcfd: modify_end
```

**See Also:**

Associated varextcfd commands
 Commands in this Section:

variables

variables: activate <name>
variables: activate_all
variables: deactivate <name>
variables: evaluate <expression>
variables: modify_parameter <varname> param <num>=<string or value>
variables: notify_before_activate <toggle>
variables: save_all_constants <filename>
variables: save_constants <filename>
variables: select_varname_begin
variables: select_varname_end

See Also:

User Manual - Section 4.1, Variable Selection and Activation
How To Create New Variables
How To Activate Variables
variables: activate

Command:

variables: activate <name>

Purpose:

Activates a variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>name of the variable to activate</td>
</tr>
</tbody>
</table>

Notes:

A variable must be activated before it can be used for any purpose.

Example Usage:

```
# Activate a variable and use it
# to color a part
#
variables: activate temperature
part: select_begin
1
part: select_end
part: colorby_palette temperature
```

See Also:

Associated variables commands
Command:

variables: activate_all

Purpose:

Activates all variables.

Parameters:

none

Example Usage:

# Activating all variables
# variables: activate_all

See Also:

Associated variables commands
variables: deactivate

Command:

variables: deactivate <name>

Purpose:

Deactivates a variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>name of the variable to deactivate</td>
</tr>
</tbody>
</table>

Notes:

A deactivated variable is not available for use, but can be activated again if needed.

If a computed variable is deactivated it is deleted and must be re-specified if needed at a later time.

Example Usage:

variables: deactivate temperature

See Also:

Associated variables commands
Command:

variables: evaluate <expression>

Purpose:

Creates a computed variable.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>expression</td>
<td>expression needed to create a computed variable</td>
</tr>
</tbody>
</table>

Notes:

The expression must conform to one of the many supplied general functions or proper math or calculator operations within EnSight. It is subject to all the limitations of such, so please familiarize yourself with these.

Example Usage:

part: select_all
variables: activate_all
variables: evaluate Area = Area(plist)
variables: evaluate Grad = Grad(plist,temperature)
variables: evaluate CmplxTransResp = CmplxTransResp(plist,c_scalar,90.0)

See Also:

Associated variables commands
variables: modify_parameter

**Command:**

```
variables: modify_parameter <varname> param <num>=<string or value>
```

**Purpose:**

Modifies a parameter of a general function computed variable.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>varname</td>
<td>computed variable’s name</td>
</tr>
<tr>
<td>int</td>
<td>num</td>
<td>parameter number for the computed variable</td>
</tr>
<tr>
<td>string, float or int</td>
<td>string or value</td>
<td>proper modified string, or number for the parameter specified</td>
</tr>
</tbody>
</table>

**Notes:**

Currently only used for modifying the phase angle of a complex transient response variable.

**Example Usage:**

```
variables: activate_all
part: select_all
variables: evaluate CmplxTransResp = CmplxTransResp(plist,c_scalar,90.0)
function: palette CmplxTransResp
variables: modify_parameter CmplxTransResp param 3=1.1700e+02
```

**See Also:**

Associated `variables` commands
variables: notify_before_activate

Command:

variables: notify_before_activate <toggle>

Purpose:

A preference that can be set concerning notification when a variable will activated. Since EnSight by default activates variables automatically if needed, this command can cause a confirmation to be requested before a variable is activated.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON user will be asked to confirm a variable activation</td>
</tr>
</tbody>
</table>
|         |           | OFF automatic variable activation occurs without any confirmation request (the default)

Example Usage:

variables: notify_before_activate ON

See Also:

Associated variables commands
variables: save_all_constants

Command:
variables: save_all_constants <filename>

Purpose:
Saves all active constant variable values to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the file in which to save the constants</td>
</tr>
</tbody>
</table>

Example Usage:

```
# Activating all variables
variables: activate_all
# Computing area of one part
# part: select_begin 1
part: select_end
variables: evaluate Area = Area(plist)
# Computing area of another part
# part: select_begin 2
part: select_end
variables: evaluate Area2 = Area(plist)
variables: save_all_constants /usr/tmp/all_constants
```

See Also:

Associated variables commands
Command:

```plaintext
variables: save_constants <filename>
```

Purpose:
Saves selected constant variable values to a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the file in which to save the constants</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# # Activating all variables #
variables: activate_all #
# # Computing area of one part #
part: select_begin 1
part: select_end
variables: evaluate Area = Area(plist) #
# # Computing area of another part #
#
part: select_begin 2
part: select_end
variables: evaluate Area2 = Area(plist) #
# # Selecting the computed area constant to write them out #
variables: select_varname_begin
Area
Area2
variables: select_varname_end #
# # Saving the areas to a file #
variables: save_constants /usr/tmp/my_constants
```

See Also:

Associated `variables` commands
variables: select_varname_begin/end

Command:

variables: select_varname_begin
<varname>
<varname>
.
.
<varname>
variables: select_varname_end

Purpose:

Selects variables for future use.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>varname</td>
<td>valid name of a variable</td>
</tr>
</tbody>
</table>

Example Usage:

```
# # Activating all variables
# variables: activate_all
# # Computing area of one part
# part: select_begin
1
part: select_end
variables: evaluate Area = Area(plist)
# # Computing area of another part
# # part: select_begin
2
part: select_end
variables: evaluate Area2 = Area(plist)
# # Selecting the computed area constant to write them out
# variables: select_varname_begin
Area
Area2
variables: select_varname_end
# # Saving the areas to a file
# variables: save_constants /usr/tmp/my_constants
```

See Also:

Associated `variables` commands
Commands in this Section:

vctarrow

vctarrow: arrow_location <location>
vctarrow: arrow_type <type>
vctarrow: begin
vctarrow: end
vctarrow: component <x_scale> <y_scale> <z_scale>
vctarrow: create
vctarrow: density <value>
vctarrow: display_offset <offset>
vctarrow: projection <proj>
vctarrow: scale_factor <scale/time>
vctarrow: select_default
vctarrow: threshold_low <low>
vctarrow: threshold_high <high>
vctarrow: thresholds <type>
vctarrow: tip_rgb <red_val> <grn_val> <blu_val>
vctarrow: tip_shape <type>
vctarrow: tip_size <size>
vctarrow: tip_size_rep <rep>
vctarrow: variable <var_name>

See Also:

User Manual - Section 7.6, Vector Arrow Create/Update
How To Create Vector Arrows
**vctarrow: arrow_location**

**Command:**

```
vctarrow: arrow_location <location>
```

**Purpose:**

Control the location of the arrows

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>location</td>
<td>vertices draw vectors at vertices (corner nodes)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>node draw vectors at all nodes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>element_center draw vectors at element centers</td>
</tr>
</tbody>
</table>

**Notes:**

Discrete particles can only use the 'node' vector location.

For linear elements 'node' and 'vertices' give the same result.

**Example Usage:**

```
part: select_begin
2
part: select_end
part: modify_begin
vctarrow: arrow_location element_center
part: modify_end
```

**See Also:**

Associated vctarrow commands
Command:

\texttt{vctarrow: arrow_type <type>}

Purpose:

Change the visual representation of the arrow shafts

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>rectilinear: straight arrows with the length proportional to the vector magnitude</td>
</tr>
<tr>
<td>rect_fixed</td>
<td></td>
<td>straight arrows of fixed length</td>
</tr>
<tr>
<td>curved</td>
<td></td>
<td>arrow shaft curves with the vector</td>
</tr>
</tbody>
</table>

Example Usage:

\begin{verbatim}
part: select_begin
2
part: select_end
part: modify_begin
vctarrow: arrow_type curved
part: modify_end
\end{verbatim}

See Also:

Associated \texttt{vctarrow} commands
**vctarrow: begin/end**

**Command:**

```
vctarrow: begin
vctarrow: end
```

**Purpose:**

Delimit the modifications for vector arrow attributes

**Parameters:**

none

**Notes:**

These commands are used to set the attributes for a vector arrow part creation.

**Example Usage:**

```
vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
```

**See Also:**

Associated `vctarrow` commands
Command:

\[
\text{vctarrow: component}\ <x\_scale>\ <y\_scale>\ <z\_scale>
\]

Purpose:

Specify a scaling factor for each component of the vector variable, to be used in calculating both the magnitude and direction of the vector arrow.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scale</td>
<td>scaling for the x-component</td>
</tr>
<tr>
<td></td>
<td>y_scale</td>
<td>scaling for the y-component</td>
</tr>
<tr>
<td></td>
<td>z_scale</td>
<td>scaling for the z-component</td>
</tr>
</tbody>
</table>

Notes:

Specify 1 to use the full value of a component. Specify 0 to ignore the corresponding vector components (and thus confine all vector arrows to planes perpendicular to that axis).

Values may be negative to reverse the direction of the component.

Example Usage:

\[
\text{vctarrow: begin}\\
\text{vctarrow: variable VITESSE}\\
\text{vctarrow: end}\\
\text{vctarrow: create}\\
\text{part: select\_begin}\\
\text{2}\\
\text{part: select\_end}\\
\text{part: modify\_begin}\\
\text{vctarrow: component 2.0000e+00 1.0000e+00 1.0000e+00}\\
\text{part: modify\_end}
\]

See Also:

Associated vctarrow commands
vctarrow: create

Command:

vctarrow: create

Purpose:

Create a new vector arrow part using the currently defined attributes and selected parent parts.

Parameters:

none

Notes:

The vector variable must be set via the vctarrow: variable command before the part can be created.

Example Usage:

variables: activate VITESSE
part: select_all
vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create

See Also:

Associated vctarrow commands
Command:

\texttt{vctarrow: density \textless{}value\textgreater{}}

Purpose:

Control the fraction of the parent's nodes which will display a vector.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>density value between 0 and 1</td>
</tr>
</tbody>
</table>

Notes:

A value of 0.0 results in no arrows, while a value of 1.0 results in an arrow at every node. Between these two values the arrows are randomly distributed at the specified density.

Example Usage:

\texttt{vctarrow: begin}
\texttt{vctarrow: variable VITESSE}
\texttt{vctarrow: end}
\texttt{vctarrow: create}
\texttt{part: select_begin}
\texttt{2}
\texttt{part: select_end}
\texttt{part: modify_begin}
\texttt{vctarrow: density \texttt{5.0000e-01}}
\texttt{part: modify_end}

See Also:

Associated \texttt{vctarrow} commands
vctarrow: display_offset

Command:

vctarrow: display_offset <offset>

Purpose:

Specify a visual offset for the vectors from the surface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>offset</td>
<td>offset in world coordinates</td>
</tr>
</tbody>
</table>

Notes:

A positive offset moves the vector away from the surface in the direction of the normal.

Example Usage:

vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
2
part: select_end
part: modify_begin
vctarrow: display_offset 1.0000e-01
part: modify_end

See Also:

Associated vctarrow commands
vctarrow: projection

**Command:**

```
vctarrow: projection <proj>
```

**Purpose:**

Apply a projection to the vectors prior to display

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>proj</td>
<td>all create the vector arrows using all components of the specified vector</td>
</tr>
<tr>
<td></td>
<td></td>
<td>normal create the vector arrows using the components normal to the surface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tangential create the vector arrows using the components tangential to the surface</td>
</tr>
<tr>
<td></td>
<td></td>
<td>component create two arrows for each target location - one normal and one tangential</td>
</tr>
</tbody>
</table>

**Notes:**

Vector components are scaled prior to computing the projections.

**Example Usage:**

```
variables: activate velocity
vctarrow: begin
vctarrow: variable velocity
vctarrow: end
vctarrow: create
part: select_begin
4
part: select_end
part: modify_begin
vctarrow: projection component
part: modify_end
```

**See Also:**

Associated vctarrow commands
vctarrow: scale_factor

Command:

vctarrow: scale_factor <scale/time>

Purpose:

Control the length of the vector arrows

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>scale/time</td>
<td>scale factor or time</td>
</tr>
</tbody>
</table>

Notes:

If the arrow type is "Rectilinear" this parameter is a scaling multiple to change the magnitude of the vectors. If the type is "Rect_fixed" the parameter specifies the absolute magnitude for each vector. If the type is "Curved" this parameter controls the integration time for the streamlines which make up the curved part of the arrow.

Example Usage:

vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
  2
part: select_end
part: modify_begin
vctarrow: scale_factor 7.0000e-01
part: modify_end

See Also:

Associated vctarrow commands
Command:

vctarrow: select_default

Purpose:

Sets the target to the default settings for subsequent attribute modifications.

Parameters:

none

Example Usage:

vctarrow: select_default
part: modify_begin
vctarrow: variable VITESSE
part: modify_end

See Also:

Associated vctarrow commands
vctarrow: threshold_low/high

Command:

vctarrow: threshold_low <low>
vctarrow: threshold_high <high>

Purpose:

Set the low or high threshold value

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>low</td>
<td>low filter threshold</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>high filter threshold</td>
</tr>
</tbody>
</table>

Notes:

Used with vctarrow: thresholds

Example Usage:

vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
2
part: select_end
part: modify_begin
vctarrow: thresholds band
part: modify_end
part: modify_end
vctarrow: threshold_low 5.0000e-1
part: modify_end
part: modify_begin
vctarrow: threshold_high 7.5000e-1
part: modify_end

See Also:

Associated vctarrow commands
Command:

vctarrow: thresholds <type>

Purpose:

Apply a threshold filter to the selection of vectors for display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>display all vectors</td>
</tr>
<tr>
<td></td>
<td>low</td>
<td>display vectors above the low threshold</td>
</tr>
<tr>
<td></td>
<td>band</td>
<td>display vectors below the low and above the high threshold</td>
</tr>
<tr>
<td></td>
<td>high</td>
<td>display vectors below the high threshold</td>
</tr>
<tr>
<td></td>
<td>low_high</td>
<td>display vectors between low and high threshold</td>
</tr>
</tbody>
</table>

Notes:

Threshold filtering occurs after density filtering. When using both forms of filtering in combination the actual vector density may not be exactly as specified.

Example Usage:

vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
  2
part: select_end
part: modify_begin
vctarrow: thresholds band
part: modify_end
part: modify_begin
vctarrow: threshold_low 5.0000e-1
part: modify_end
part: modify_begin
vctarrow: threshold_high 7.5000e-1
part: modify_end

See Also:

Associated vctarrow commands
vctarrow: tip_rgb

Command:

    vctarrow: tip_rgb <red_val> <grn_val> <blu_val>

Purpose:

Change the color of the arrow tips

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue components of the color tip (range 0.0 to 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The color of the tip is only used when the tip shape is 'tipped'

Example Usage:

    vctarrow: begin
    vctarrow: variable VITESSE
    vctarrow: end
    vctarrow: create
    part: select_begin
    2
    part: select_end
    part: modify_begin
    vctarrow: tip_shape tipped
    part: modify_end
    part: modify_begin
    vctarrow: tip_rgb 0.0000e00 1.0000e00 0.0000e00
    part: modify_end

See Also:

Associated vctarrow commands
Command:

```
vctarrow: tip_shape <type>
```

Purpose:

Change the visual representation of the arrow tips

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>none no arrow tips</td>
</tr>
<tr>
<td></td>
<td></td>
<td>normal arrow tip displayed as two short lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>triangle arrow tip displayed as two orthogonal triangles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tipped arrow tip displayed in a different color</td>
</tr>
</tbody>
</table>

Example Usage:

```
vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
  2
part: select_end
part: modify_begin
vctarrow: tip_shape triangle
part: modify_end
```

See Also:

Associated `vctarrow` commands
**vctarrow: tip_size**

**Command:**

\[ \text{vctarrow: tip_size <size>} \]

**Purpose:**

Change the size of the arrow tips

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>size</td>
<td>size of the arrow tips</td>
</tr>
</tbody>
</table>

**Notes:**

This parameter is only used for 'triangle' or 'normal' arrow tips, and only when the tip size is 'fixed'.

**Example Usage:**

```plaintext
vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
  2
part: select_end
part: modify_begin
vctarrow: tip_shape triangle
part: modify_end
part: modify_begin
vctarrow: tip_size_rep fixed
part: modify_end
part: modify_begin
vctarrow: tip_size 2.0000e-1
part: modify_end
```

**See Also:**

Associated vctarrow commands
Command:

vctarrow: tip_size_rep <rep>

Purpose:

Set the method for determining tip size

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>rep</td>
<td>fixed</td>
</tr>
<tr>
<td>proportional</td>
<td></td>
<td>proportional</td>
</tr>
</tbody>
</table>

Notes:

This parameter is only used for 'triangle' or 'normal' arrow tips.

Example Usage:

vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
part: select_begin
2
part: select_end
part: modify_begin
vctarrow: tip_shape triangle
part: modify_end
part: modify_begin
vctarrow: tip_size_rep fixed
part: modify_end
part: modify_begin
vctarrow: tip_size 2.0000e-1
part: modify_end

See Also:

Associated vctarrow commands
vctarrow: variable

Command:

```
vctarrow: variable <var_name>
```

Purpose:

Specify the vector variable to be used for vector arrow creation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>var_name</td>
<td>name of an active vector variable</td>
</tr>
</tbody>
</table>

Notes:

The variable must be activated before it can be used in a vector arrow plot.

Example Usage:

```
variables: activate VITESSE
part: select_all
vctarrow: begin
vctarrow: variable VITESSE
vctarrow: end
vctarrow: create
```

See Also:

Associated vctarrow commands
Commands in this Section:

view

- view: bounds <toggle>
- view: clipping <toggle>
- view: default_orientation <direction>
- view: fast_display <toggle>
- view: full_screen <toggle>
- view: hardware_line_offset <toggle>
- view: hidden_line <toggle> [red_val > grn_val > blu_val]
- view: hidden_surface <toggle>
- view: perspective <toggle>
- view: stereo <toggle>

See Also:

User Manual - Section 8.6, View Mode
How To Set Global Viewing Parameters
How To Set Drawing Mode (Line, Surface, Hidden Line)
How To Enable Stereo Viewing
view: bounds

Command:

view: bounds <toggle>

Purpose:

Toggles on or off the global bounds display

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turns on bounds display</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turns off bounds display</td>
</tr>
</tbody>
</table>

Notes:

Bounds display will be visible in a viewport if this toggle is ON and the "viewport_bounds: visible ON" is also set.

Example Usage:

```
# turn on bounds display but turn the bounds off for viewport 1
#
view: bounds ON
viewport: select_begin
1
viewport: select_end
viewport_bounds: visible OFF
```

See Also:

Associated view commands
Command:

view: clipping <toggle>

Purpose:

Toggles on or off the auxiliary clipping plane

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

When auxiliary clipping is on, objects on the negative side of the plane tool are not drawn. By toggling on or off parts' individual auxiliary clipping attribute (part: clip), some parts can be clipped while others are not.

Example Usage:

```
tools: plane ON
view: clipping ON
part: select_partname_begin
"(CASE:Case 1)ami-x hypersonic body"
part: select_partname_end
part: modify_begin
part: clip OFF
part: modify_end
view_transf: function plane
view_transf: rotate 106.516396 0.000000 0.000000
view_transf: function global
```

See Also:

Associated view commands
**Command:**

```
view: default_orientation <direction>
```

**Purpose:**

Sets the default view orientation.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>direction</td>
<td>+x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-x</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+z</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-z</td>
</tr>
</tbody>
</table>

**Notes:**

Must be executed before data is read.

The default is +z

**Example Usage:**

```
view: default_orientation +x
```

**See Also:**

Associated `view` commands
Command:

```
view: fast_display <toggle>
```

Purpose:

Toggles the fast display setting. When on, parts can be rendered using an alternative representation while being interactively moved.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON (turns on fast display)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF (turns off fast display)</td>
</tr>
</tbody>
</table>

Notes:

Each part has an attribute that indicates how it will be drawn when fast display is on. See 'part: bounding_rep'.

Example Usage:

```
view: fast_display ON
part: select_partname_begin
"(CASE:Case 1)external flow field"
part: select_partname_end
part: modify_begin
part: bounding_rep points
part: modify_end
view_transf: rotate -3.021584 51.034481 0.000000
view_transf: function global
```

See Also:

Associated view commands
view: full_screen

Command:

view: full_screen <toggle>

Purpose:

Toggles full screen rendering

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

During full screen rendering, the graphics window fills the screen hiding the rest of the user interface and other windows.

Example Usage:

view: full_screen ON

See Also:

Associated view commands
Command:

view: hardware_line_offset <toggle>

Purpose:

Toggles on or off the use of hardware line offset

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

This command is only used for view preferences.

Example Usage:

- view: hardware_line_offset ON
- view: default_orientation +Z
- view: hidden_surface OFF

See Also:

Associated view commands
view: hidden_line

Command:

\[
\text{view: hidden_line <toggle> [<red_val> <grn_val> <blu_val>]}
\]

Purpose:

Toggles global hidden line drawing.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON turns on hidden line drawing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF turns off hidden line drawing</td>
</tr>
<tr>
<td>float</td>
<td>red_val</td>
<td>optional red, green, blue color values (range 0.0 to 1.0) for the hidden lines when hidden surface (See \text{view: hidden_surface}) is also ON</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Each part has a part attribute that determines whether or not it will be drawn with hidden lines if the global setting is on (See \text{part: hidden_line}).

If the optional RGB values are specified, they must be values between 0.0 and 1.0. If none are specified, then 0.0, 0.0, 0.0 are used.

Example Usage:

```
VERSION 7.41
view: hidden_line ON 1.0000e+00 0.0000e+00 0.0000e+00
part: modify_begin
part: hidden_line OFF
part: modify_end
```

See Also:

Associated view commands
Command:

`view: hidden_surface <toggle>`

Purpose:

Toggles display of shaded surfaces.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Each part has an attribute that determines whether it will be drawn in shaded or in line mode (`part: hidden_surface`).

Example Usage:

```
view: hidden_surface ON
part: select_partname_begin
"(CASE:Case 1)ami-x hypersonic body"
part: select_partname_end
part: modify_begin
part: hidden_surface OFF
part: modify_end
```

See Also:

Associated `view` commands
view: perspective

Command:

    view: perspective <toggle>

Purpose:

    Toggles global perspective rendering.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

    Perspective rendering causes things further in distance to appear smaller than closer objects. If this setting is off then objects will be rendered in orthographic mode which does not use perspective foreshortening.

    Each viewport has a local setting. See `viewport: perspective`

Example Usage:

    view: perspective ON

See Also:

    Associated view commands
Command:

```
view: pick_mode <value>
```

Purpose:

Sets what type of pick will be performed when the 'p' key is pressed.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>value</td>
<td>center_of_transform: pick a point to set the center of transformation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cursor: pick a point to specify the cursor tool location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>line: pick two points to specify the line tool location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>look_at: set the look at point</td>
</tr>
<tr>
<td></td>
<td></td>
<td>part: select the part under the mouse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plane: pick three points to specify the plane tool location</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plane_2pt: draw a line to position the plane tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plane_normal: pick the plane tool z-direction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>plane_origin: pick the plane tool origin</td>
</tr>
</tbody>
</table>

Notes:

See the EnSight User's Manual for instructions on how to operate each of these picks.

Example Usage:

```
view: pick_mode part
view: pick_mode cursor
```

See Also:

Associated `view` commands
view: static_lighting

**Command:**

`view: static_lighting <toggle>`

**Purpose:**

Toggles the static lighting model.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turns on static lighting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
<tr>
<td></td>
<td></td>
<td>turns off static lighting</td>
</tr>
</tbody>
</table>

**Notes:**

If static lighting is off (the default), then the light does not move as the scene moves. If it is on, then the light will move as the scene moves. The light direction for static lighting is set when it is toggled on.

**Example Usage:**

`view: static_lighting ON`

**See Also:**

Associated `view` commands
Command:

```
view: stereo <toggle>
```

Purpose:

Toggles stereo rendering.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>turned on stereo rendering</td>
</tr>
<tr>
<td></td>
<td>ON</td>
<td>turns on stereo rendering</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>turns off stereo rendering</td>
</tr>
</tbody>
</table>

Notes:

Stereo rendering will only occur if the graphics hardware supports it.

Example Usage:

```
view: stereo ON
test: larger stereo separation
```

See Also:

Associated `view` commands
view: stereo
Commands in this Section:

transfer

transfer: action <method>
transfer: axis <which>
transfer: box_axis <axis> <x_comp> <y_comp> <z_comp>
transfer: box_length <x_len> <y_len> <z_len>
transfer: box_origin <x_ori> <y_ori> <z_ori>
transfer: center_of_transform <x_coord> <y_coord> <z_coord>
transfer: cone_angle <angle>
transfer: cone_axis <x_comp> <y_comp> <z_comp>
transfer: cone_origin <x_coord> <y_coord> <z_coord>
transfer: cursor <x_coord> <y_coord> <z_coord>
transfer: cylinder_axis <x_comp> <y_comp> <z_comp>
transfer: cylinder_origin <x_coord> <y_coord> <z_coord>
transfer: cylinder_radius <rad>
transfer: distance <dist>
transfer: function <mode>
transfer: initialize_viewports
transfer: limit <value>
transfer: line <end_pt> <x_coord> <y_coord> <z_coord>
transfer: line_length <length>
transfer: look_at <x_coord> <y_coord> <z_coord>
transfer: look_from <x_coord> <y_coord> <z_coord>
transfer: plane <corner_pt> <x_coord> <y_coord> <z_coord>
transfer: plane_equation <A> <B> <C> <D>
transfer: plane_normal <x_dir> <y_dir> <z_dir>
transfer: plane_origin <x_ori> <y_ori> <z_ori>
transfer: plane_size <x_size> <y_size>
transfer: redo
transfer: reset_by_action
transfer: reset_rot_trn_scl
transfer: reset_tool_constrain <option>
transfer: restore_view <filename>
transfer: revolution_#_of_points <number_of>
transfer: revolution_axis <x_comp> <y_comp> <z_comp>
transfer: revolution_origin <x_coord> <y_coord> <z_coord>
transfer: revolution_point <pt_number> <x_coord> <y_coord> <z_coord>
transfer: rotate <x_ang> <y_ang> <z_ang>
transfer: save_view <filename>
transfer: scale <x_scale> <y_scale> <z_scale>
transfer: sphere_axis <x_comp> <y_comp> <z_comp>
transfer: sphere_origin <x_coord> <y_coord> <z_coord>
transfer: sphere_radius <value>
transfer: spin <num> <x_ang> <y_ang> <z_ang>
transfer: translate <x_dist> <y_dist> <z_dist>
transfer: undo
transfer: view_recall <option>
transfer: view_store <option>
transfer: viewport_link <toggle>
transfer: viewport_state_copy
view_transf

view_transf: zclip_back <z_loc>
view_transf: zclip_float <toggle>
view_transf: zclip_front <z_loc>
view_transf: zclip_min <z_min>
view_transf: zoom <factor>
view_transf: zoom_style <style>

See Also:

User Manual - Chapter 9, Transformation Control
How To Rotate, Zoom, Translate, Scale
How To Set Z Clipping
How To Set LookFrom / LookAt
How To Set Auxiliary Clipping
How To Define and Change Viewports
How To Save and Restore Viewing Parameters
How To Reset Tools and Viewports
Command:

view_transf: action <method>

Purpose:

Sets the transformation method for interaction in the user interface.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>method</td>
<td></td>
</tr>
<tr>
<td></td>
<td>rotate</td>
<td>sets transformation mode to rotate</td>
</tr>
<tr>
<td></td>
<td>translate</td>
<td>sets transformation mode to translate</td>
</tr>
<tr>
<td></td>
<td>scale</td>
<td>sets transformation mode to scale</td>
</tr>
<tr>
<td></td>
<td>zoom</td>
<td>sets transformation mode to zoom</td>
</tr>
<tr>
<td></td>
<td>band_zoom</td>
<td>initialize for a rubber band zoom</td>
</tr>
</tbody>
</table>

Notes:

This is not a necessary command. It is used to change the user interface to reflect the transformation currently attached to the mouse button tied to the transformation action (by default the left mouse button).

Example Usage:

view_transf: action translate

See Also:

Associated view_transf commands
view_transf: axis

Command:

`view_transf: axis <which>`

Purpose:

Sets the axis to use for rotate, translate, and scale transformations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>which</td>
<td></td>
</tr>
<tr>
<td></td>
<td>x</td>
<td>action will take place about or in the direction of the x axis</td>
</tr>
<tr>
<td></td>
<td>y</td>
<td>action will take place about or in the direction of the y axis</td>
</tr>
<tr>
<td></td>
<td>z</td>
<td>action will take place about or in the direction of the z axis</td>
</tr>
<tr>
<td></td>
<td>all</td>
<td>action will take place about or in the direction of the all three (or the combined) axes</td>
</tr>
</tbody>
</table>

Notes:

Used in the transformation dialog to control the axis about which transformational values are applied.

The axis is either the global system or, if in Frame mode, the selected frame’s axis system.

Example Usage:

```
# Set the axis to x
# and rotate about the x axis 15 degrees
#
view_transf: axis x
view_transf: rotate 15.000000 0.000000 0.000000
#
# Set the axis to be y
# and translate one unit in the -negative y direction
#
view_transf: axis y
view_transf: translate 0.0000e+00 -1.0000e+00 0.0000e+00
```

See Also:

Associated `view_transf` commands
Command:

\[
\text{view_transf: box_axis <axis> <x\_comp> <y\_comp> <z\_comp>}
\]

Purpose:

Specify the direction vectors for a box tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>axis</td>
<td>x specifies which axis is being defined</td>
</tr>
<tr>
<td></td>
<td></td>
<td>y</td>
</tr>
<tr>
<td></td>
<td></td>
<td>z</td>
</tr>
<tr>
<td>float</td>
<td>x_comp</td>
<td>The x component of the direction vector</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td>The y component of the direction vector</td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td>The z component of the direction vector</td>
</tr>
</tbody>
</table>

Notes:

The direction vectors are in reference to the selected coordinate frame.

Example Usage:

```
tools: box ON
view_transf: box_length 3.000000e+00 4.000000e+00 5.000000e+00
view_transf: box_origin 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: box_axis x 1.000000e+00 0.000000e+00 0.000000e+00
view_transf: box_axis y 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: box_axis z 0.000000e+00 0.000000e+00 1.000000e+00
```

See Also:

Associated `view_transf` commands
view_transf: box_length

Command:

   view_transf: box_length <x_len> <y_len> <z_len>

Purpose:

Specify the size of the box tool in the x, y, and z directions.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_len</td>
<td>The length of box tool in the x, y, z direction</td>
</tr>
<tr>
<td></td>
<td>y_len</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_len</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The lengths are in relation to the box axis directions.

Example Usage:

   tools: box ON
   view_transf: function box
   view_transf: box_length 3.000000e+00 4.000000e+00 5.000000e+00
   view_transf: box_origin 0.000000e+00 1.000000e+00 0.000000e+00
   view_transf: box_axis x 1.000000e+00 0.000000e+00 0.000000e+00
   view_transf: box_axis y 0.000000e+00 1.000000e+00 0.000000e+00
   view_transf: box_axis z 0.000000e+00 0.000000e+00 1.000000e+00

See Also:

   Associated view_transf commands
view_transf: box_origin

Command:

view_transf: box_origin <x_ori> <y_ori> <z_ori>

Purpose:
Specify the origin of the box tool in reference to the selected coordinate frame.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>x_ori</td>
<td>The x, y, z origin of the box tool</td>
</tr>
<tr>
<td></td>
<td>y_ori</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_ori</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

tools: box ON
view_transf: function box
view_transf: box_length 3.000000e+00 4.000000e+00 5.000000e+00
view_transf: box_origin 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: box_axis x 1.000000e+00 0.000000e+00 0.000000e+00
view_transf: box_axis y 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: box_axis z 0.000000e+00 0.000000e+00 1.000000e+00

See Also:

Associated view_transf commands
view_transf: center_of_transform

Command:

view_transf: center_of_transform <x_coord> <y_coord> <z_coord>

Purpose:

Set the point in space that will be the origin for transformations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>model x coordinate of the desired transformation origin</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td>model y coordinate of the desired transformation origin</td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td>model z coordinate of the desired transformation origin</td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Cannot be set during keyframe animation.

Example Usage:

```plaintext
# Selecting two viewports
viewport: select_begin
2 3
viewport: select_end
#
# Setting the center of transformations to be
# at (.5 .6 1) for each of these viewports
#
view_transf: center_of_transform 5.0000e-01 6.0000e-01 1.0000e+00
```

See Also:

Associated `view_transf` commands
Command:

```plaintext
view_transf: cone_angle <angle>
```

Purpose:

Set the angle for the cone tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>angle</td>
<td>the cone angle (in degrees)</td>
</tr>
</tbody>
</table>

Notes:

Use with `view_transf: cone_axis` and `view_transf: cone_origin` to specify the cone tool location and orientation.

Example Usage:

```plaintext
# Turns the display of the quadric cone on
# (only one quadric tool at a time can be on)
# tools: quadric cone
# Sets the angle and other attributes of the cone tool
# view_transf: cone_angle 25.000000
view_transf: cone_axis 1.000000 0.100000 0.000000
view_transf: cone_origin -0.750000 0.700000 1.000000
# Turns off the display of the quadric tool
# tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: cone_axis

Command:

    view_transf: cone_axis <x_comp> <y_comp> <z_comp>

Purpose:

Sets the axis for the cone tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z directional components for the cone tool axis</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Use with `view_transf: cone_angle` and `view_transf: cone_origin` to specify the cone tool location and orientation.

The components are in reference to the selected frame.

Example Usage:

```plaintext
# Turns display of the quadric cone on
# (only one quadric tool at a time can be on)
# tools: quadric cone
# Sets the axis and other attributes of the cone tool
# view_transf: cone_angle 25.000000
view_transf: cone_axis 1.000000 0.100000 0.000000
view_transf: cone_origin -0.750000 0.700000 1.000000
# Turns off the display of the quadric tool
# tools: quadric none
```

See Also:

Associated `view_transf` commands
Command:

\texttt{view\_transf: cone\_origin \textless x\_coord\textgreater \textless y\_coord\textgreater \textless z\_coord\textgreater}

Purpose:
Sets the origin point for the tip of the cone tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>\textit{x_coord}</td>
<td>x, y, z coordinates of the cone tool origin</td>
</tr>
<tr>
<td></td>
<td>\textit{y_coord}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>\textit{z_coord}</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Use \texttt{view\_transf: cone\_angle} and \texttt{view\_transf: cone\_axis} to specify the cone tool location and orientation.

The components are in reference to the selected frame.

Example Usage:

```
# # Turns display of the quadric cone on # (only one quadric tool at a time can be on) #
tools: quadric cone # # Sets the origin and other attributes of the cone tool #
view\_transf: cone\_angle 25.000000
view\_transf: cone\_axis 1.000000 0.100000 0.000000
view\_transf: cone\_origin -0.750000 0.700000 1.000000
# # Turns off the display of the quadric tool # tools: quadric none
```

See Also:

Associated \texttt{view\_transf} commands
view_transf: cursor

Command:

    view_transf: cursor <x_coord> <y_coord> <z_coord>

Purpose:

Sets the location of the cursor tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of the cursor</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The components are in reference to the selected frame.

Example Usage:

```
# Sets the cursor to the point (.79563 1 .8554)
#
view_transf: cursor 0.795630 1.000000 0.855400
```

See Also:

Associated view_transf commands
Command:

```
view_transf: cylinder_axis <x_comp> <y_comp> <z_comp>
```

Purpose:
Sets the axis for the cylinder tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z directional components for the cylinder tool axis</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Use with `view_transf: cylinder_origin` and `view_transf: cylinder_radius` to fully define the cylinder tool.

The components are in reference to the selected frame.

Example Usage:

```
# # Turns display of the quadric cylinder on
# (only one quadric tool at a time can be on)
#
tools: quadric cylinder
#
# Sets the axis and other attributes of the cylinder tool
#
view_transf: cylinder_axis 1.000000 0.100000 0.000000
view_transf: cylinder_origin -0.750000 0.700000 1.000000
view_transf: cylinder_radius 1.500000
#
# Turns off the display of the quadric tool
#
tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: cylinder_origin

Command:

\[
\text{view_transf: cylinder_origin } <x\_coord> <y\_coord> <z\_coord>
\]

Purpose:

Sets the origin point for one end of the cylinder tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of the cylinder tool origin</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Use with \text{view_transf: cylinder_axis} and \text{view_transf: cylinder_radius} to fully define the cylinder tool.

The components are in reference to the selected frame.

Example Usage:

```
#
# Turns display of the quadric cylinder on
# (only one quadric tool at a time can be on)
#
tools: quadric cylinder
#
# Sets the origin and other attributes of the cylinder tool
#
view_transf: cylinder_axis 1.000000 0.100000 0.000000
view_transf: cylinder_origin -0.750000 0.700000 1.000000
view_transf: cylinder_radius 1.500000
#
# Turns off the display of the quadric tool
#
tools: quadric none
```

See Also:

Associated \text{view_transf} commands
Command:

`view_transf: cylinder_radius <rad>`

Purpose:

Set the radius value for the cylinder tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>rad</td>
<td>cylinder radius value (in model coordinates)</td>
</tr>
</tbody>
</table>

Notes:

Use with `view_transf: cylinder_origin` and `view_transf: cylinder_axis` to fully define the cylinder tool.

Example Usage:

```sh
# Turns the display of the quadric cylinder on
# (only one quadric tool at a time can be on)
#
tools: quadric cylinder
#
# Sets the radius and other attributes of the cylinder tool
#
view_transf: cylinder_axis 1.000000 0.100000 0.000000
view_transf: cylinder_origin -0.750000 0.700000 1.000000
view_transf: cylinder_radius 1.500000
#
# Turns off the display of the quadric tool
#
tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: distance

Command:

    view_transf: distance <dist>

Purpose:

Sets the distance from the look_from to the look_at point.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>dist</td>
<td>distance between the look_from and the look_at point (in model system)</td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

This command causes the look_from point to move along the line between the look_from and the look_at point to the desired distance. The look_at point does not move.

Example Usage:

```plaintext
# # Selecting two viewports
#
viewport: select_begin
1 3
viewport: select_end
#
# Setting the look_at and look_from points
# for each of these viewports
#
view_transf: look_at 1.0000e+00 5.0000e-01 1.0000e+00
view_transf: look_from 5.0000e-01 5.0000e-01 2.0000e+01
#
# Changing the distance between the look_at and the look_from
# points. The look_at point will not change, but the
# look_from point will be moved appropriately
#
view_transf: distance 2.5000e+01
```

See Also:

Associated view_transf commands
Command:

`view_transf: function <mode>`

Purpose:

Sets the transformation mode.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>box</td>
<td>box tool mode (rotate, translate or scale the box tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>cone</td>
<td>quadric cone tool mode (translate or scale the cone tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>cursor</td>
<td>cursor tool mode (translate cursor in global or local frame directions according to frame selected)</td>
</tr>
<tr>
<td></td>
<td>cylinder</td>
<td>quadric cylinder tool mode (translate or scale the cylinder tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>frame</td>
<td>frame definition mode (rotates or translates the selected frame coordinate triad directions and/or origin in the model coordinate system)</td>
</tr>
<tr>
<td></td>
<td>global</td>
<td>global transformation mode (rotate, translate, zoom, or scale the model about the screen coordinate system)</td>
</tr>
<tr>
<td></td>
<td>line</td>
<td>line tool mode (translate or scale the line tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>local</td>
<td>local transformation mode (rotate, translate, zoom, or scale the model about a local axis frame)</td>
</tr>
<tr>
<td></td>
<td>plane</td>
<td>plane tool mode (rotate, translate or scale the plane tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>revolution</td>
<td>quadric revolution tool mode (translate or scale the revolution tool according to the global or local frame selected)</td>
</tr>
<tr>
<td></td>
<td>sphere</td>
<td>quadric sphere tool mode (translate or scale the sphere tool according to the global or local frame selected)</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# Sets the function to cursor mode
# and translates the cursor
#
view_transf: function cursor
view_transf: translate 0.295634 -0.014792 -0.144601
#
# Return to global transformation mode
#
view_transf: function global
#
# Does some global transformations
#```
view_transf: function

view_transf: zoom 1.431051
view_transf: rotate -1.071430 21.547768 0.000000
view_transf: translate 0.620558 0.000000 0.000000
#
# Sets Frame transform mode (local)
#
view_transf: function local
#
# Selects the viewport and frame to use
#
viewport: select_begin
  3
viewport: select_end
frame: select_begin
  1
frame: select_end
#
# And translate the parts attached to frame 1
#
view_transf: translate 0.000000 0.000000E+00 -4.000000E+00 0.000000E+00
#
# Return to global transformation mode
#
view_transf: function global

See Also:

Associated view_transf commands
Command:

```
view_transf: initialize_viewports
```

Purpose:

Resets transformations, `look_at` viewing parameters, and z clipping to the original values applied when model was first displayed.

Parameters:

none

Notes:

Since transformations can be different per viewport, this can be applied to each viewport. Thus, a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# Selecting two viewports
viewport: select_begin
1 3
viewport: select_end
# Reinitializing these 2 viewports
view_transf: initialize_viewports
```

See Also:

Associated `view_transf` commands
view_transf: limit

Command:

```
view_transf: limit <value>
```

Purpose:

Sets value represented by the extreme ends of the transformation slider in the transformation dialog.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>the value to set as the limit for a complete movement of the cursor in the positive or negative directions</td>
</tr>
</tbody>
</table>

Notes:

This is a control for the user interface. Moving the slider all the way to the right will apply this value once positively. Moving it all the way to the left will apply this value once negatively. The slider is self-centering, so one can continue to apply these amounts to the selected transformations.

Associated with this is the Increment, which is the value that is applied (positively or negatively) by clicking the stepper button once.

Example Usage:

```
view_transf: limit 5.000000
```

See Also:

Associated view_transf commands
Command:

```
view_transf: line <end_pt> <x_coord> <yCoord> <z_coord>
```

Purpose:
Sets the location of the line tool by setting two endpoints.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>end_pt</td>
<td>1 - for the first end of the line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 - for the second end of the line</td>
</tr>
<tr>
<td>float</td>
<td>x_coord</td>
<td>the x coordinate of the end point</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td>the y coordinate of the end point</td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td>the z coordinate of the end point</td>
</tr>
</tbody>
</table>

Notes:
Coordinates are in reference to the selected coordinate frame.

Example Usage:
```
# Set the line tool endpoints
view_transf: line 1 -0.723300 0.700000 1.000000
view_transf: line 2 1.723300 0.500000 1.000000
```

See Also:
Associated `view_transf` commands
view_transf: line_length

Command:

\[
\text{view_transf: line_length } <\text{length}>
\]

Purpose:

Changes the line tool length.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>length</td>
<td>desired length of the line tool</td>
</tr>
</tbody>
</table>

Notes:

When this is applied, the location of endpoint 1 will not change, but endpoint 2 will be moved along the line through endpoint 1 and endpoint 2, until the points are separated by the length desired.

Example Usage:

```
#     # Set the line tool endpoints
#     view_transf: line 1 -0.723300 0.700000 1.000000
view_transf: line 2 1.723300 0.500000 1.000000
#     # Now make the tool 10 units long
#     # (endpoint 2 will be moved)
#     view_transf: line_length 10.000000
```

See Also:

Associated view_transf commands
Command:

```plaintext
view_transf: look_at <x_coord> <y_coord> <z_coord>
```

Purpose:

Sets the look_at point for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>model x, y, z coordinates of the look_at point</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Coordinates are in reference to the model coordinate system.

Example Usage:

```plaintext
# # Selecting two viewports
# viewport: select_begin
# 1 3
viewport: select_end
# # Setting the look_at and look_from points
# for each of these viewports
# view_transf: look_at 1.0000e+00 5.0000e-01 1.0000e+00
view_transf: look_from 5.0000e-01 5.0000e-01 2.0000e+01
# # Changing the distance between the look_at and the look_from
# points. The look_at point will not change, but the
# look_from point will be moved appropriately
# view_transf: distance 2.5000e+01
```

See Also:

Associated `view_transf` commands
view_transf: look_from

Command:

\texttt{view_transf: look_from <x\_coord> <y\_coord> <z\_coord>}

Purpose:

Sets the look_from point for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>model x, y, z coordinates of the look_from point</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Coordinates are in reference to the model coordinate system.

Example Usage:

```
# Selecting two viewports
viewport: select_begin
1 3
viewport: select_end
#
# Setting the look_at and look_from points
# for each of these viewports
#
view_transf: look_at 1.0000e+00 5.0000e-01 1.0000e+00
view_transf: look_from 5.0000e-01 5.0000e-01 2.0000e+01
#
# Changing the distance between the look_at and the look_from
# points. The look_at point will not change, but the
# look_from point will be moved appropriately
#
view_transf: distance 2.5000e+01
```

See Also:

Associated view_transf commands
Command:

```
view_transf: plane <corner_pt> <x_coord> <y_coord> <z_coord>
```

Purpose:

Sets the location of the plane tool by setting three corner points.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>corner_pt</td>
<td>1 - for the first corner of the plane tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 - for the second corner of the plane tool</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 - for the third corner of the plane tool</td>
</tr>
<tr>
<td></td>
<td>x_coord</td>
<td>x coordinate of the corner point</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td>y coordinate of the corner point</td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td>z coordinate of the corner point</td>
</tr>
</tbody>
</table>

Notes:

These points are best thought of as 1 being the lower left corner, 2 being the lower right corner, and 3 being the upper right corner.

Coordinates are in reference to the selected coordinate frame.

Example Usage:

```
# Set the plane tool corner points
view_transf: plane 1 -0.750000 -0.750000 0.900000
view_transf: plane 2 1.750000 -0.750000 1.100000
view_transf: plane 3 1.750000 2.000000 1.000000
```

See Also:

Associated `view_transf` commands
view_transf: plane_equation

Command:

\texttt{view\_transf: plane\_equation \textless A\textgreater \textless B\textgreater \textless C\textgreater \textless D\textgreater}

Purpose:

Sets the location of the plane tool by specifying the coefficients of the plane equation \((Ax + By + Cz = D)\).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>A</td>
<td>the x coefficient</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>the y coefficient</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>the z coefficient</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>the constant term</td>
</tr>
</tbody>
</table>

Notes:

Coefficients are in reference to the selected coordinate frame.

Example Usage:

```
# Set the plane tool by the plane equation
view_transf: plane_equation -1.000000 0.500000 12.499997 11.659089
```

See Also:

Associated \texttt{view\_transf} commands
Command:

```
view_transf: plane_normal <x_dir> <y_dir> <z_dir>
```

Purpose:

Specify the plane tool orientation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_dir</td>
<td>x, y, z component of the plane tool normal</td>
</tr>
<tr>
<td></td>
<td>y_dir</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_dir</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The normal is in reference to the selected coordinate frame.

Example Usage:

```
tools: plane ON
view_transf: function plane
#
# define the plane to be located at 0,1,0 with the z-axis (plane normal)
# pointing in the x direction. The plane is 3 units in X and 4 units in
# (x and y according to the plane definition)
#
view_transf: plane_origin 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: plane_normal 1.000000e+00 0.000000e+00 0.000000e+00
view_transf: plane_size 3.000000e+00 4.000000e+00
```

See Also:

Associated `view_transf` commands
view_transf: plane_origin

Command:

\[
\text{view_transf: plane_origin } <x_{ori}> <y_{ori}> <z_{ori}>
\]

Purpose:

Specify the plane tool origin.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_{ori}</td>
<td>The x, y, z origin of the plane tool</td>
</tr>
<tr>
<td></td>
<td>y_{ori}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_{ori}</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

The origin is in reference to the selected coordinate frame.

Example Usage:

```
tools: plane ON
view_transf: function plane
# define the plane to be located at 0,1,0 with the z-axis (plane normal)
# pointing in the x direction. The plane is 3 units in X and 4 units in
# (x and y according to the plane definition)
#
view_transf: plane_origin 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: plane_normal 1.000000e+00 0.000000e+00 0.000000e+00
view_transf: plane_size 3.000000e+00 4.000000e+00
```

See Also:

Associated view_transf commands
view_transf: plane_size

Command:

\texttt{view\_transf: plane\_size <x\_size> <y\_size>}

Purpose:

Specify the plane tool size.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_size</td>
<td>Size of the plane tool in the x, y direction</td>
</tr>
<tr>
<td></td>
<td>y_size</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

X and Y directions are according to the plane tool definition.

Example Usage:

\begin{verbatim}
tools: plane ON
view_transf: function plane
# define the plane to be located at 0,1,0 with the z-axis (plane normal)
# pointing in the x direction. The plane is 3 units in X and 4 units in Y
# (x and y according to the plane definition)
# view_transf: plane_origin 0.000000e+00 1.000000e+00 0.000000e+00
view_transf: plane_normal 1.000000e+00 0.000000e+00 0.000000e+00
view_transf: plane_size 3.000000e+00 4.000000e+00
\end{verbatim}

See Also:

Associated \texttt{view\_transf} commands
view_transf: redo

Command:

    view_transf: redo

Purpose:

Redo the undo.

Parameters:

    none

Example Usage:

    view_transf: function global
    view_transf: rotate 2.510301e+01 7.117291e+01 0.000000e+00
    view_transf: undo
    view_transf: redo

See Also:

    Associated view_transf commands
Command:

view_transf: reset_by_action

Purpose:

Initializes the current action transformation, thus removing the effect of that transformation.

Parameters:

none

Notes:

Since transformations can be different per viewport, this command can be used for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# Set the action to rotate
# and the axis to be x
#
view_transf: action rotate
view_transf: axis x
#
# Select the viewport(s) desired
#
viewport: select_begin
  0 2
viewport: select_end
#
# perform a couple of rotates
#
view_transf: rotate 0.500000 0.000000 0.000000
view_transf: rotate -30.000000 0.000000 0.000000
#
# Now remove both rotates using this command
# because the action is rotate.
#
view_transf: reset_by_action
```

See Also:

Associated view_transf commands
view_transf: reset_rot_trn_scl

Command:

    view_transf: reset_rot_trn_scl

Purpose:

Removes the rotation, translation, and scale transformations in the selected viewports.

Parameters:

    none

Notes:

Since transformations can be different per viewport, this command can be used for each viewport, thus a viewport selection is needed if more than one viewport is being used.

In Frame mode initializes the selected frames.

Example Usage:

    # Select the viewport(s) desired
    #
    viewport: select_begin
    0 2
    viewport: select_end
    #
    # perform some rotations, translations and/or scales
    #
    view_transf: rotate 15.535719 -27.859741 0.000000
    view_transf: translate 0.620558 0.000000 0.000000
    view_transf: scale 1.2000e+00 1.2000e+00 1.2000e+00
    #
    # Now remove these transformations using this command
    #
    view_transf: reset_rot_trn_scl

See Also:

    Associated view_transf commands
**Command:**

```
view_transf: reset_tool_constrain <option>
```

**Purpose:**

Sets scope for the resetting of tool locations. The reset can cause the tool to be placed at its initial default location or at the center of the parts in the current viewport.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>by_global causes the tool to be placed at the initial default location.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>by_viewport causes the tool to be placed at the center of the parts in the current viewport</td>
</tr>
</tbody>
</table>

**Notes:**

The state set here applies to all future tool resets.

**Example Usage:**

```
# Set the tool reset state to be "by viewport"
#
view_transf: reset_tool_constrain by_viewport
#
# Select the viewport(s) desired
#
viewport: select_begin
0
viewport: select_end
#
# Reset the plane tool to the center of parts in viewport 0
#
view_transf: function plane
view_transf: reset_rot_trn_scl
```

**See Also:**

Associated `view_transf` commands
**view_transf: restore_view**

**Command:**

`view_transf: restore_view <filename>`

**Purpose:**

Restores a previously saved view state file.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>name of the file containing the saved view</td>
</tr>
</tbody>
</table>

**Notes:**

Since transformations are viewport independent, you need to select the desired viewport before restoring a view state (if you are using multiple viewports).

**Example Usage:**

```
#  # Select the viewport(s) desired
#  viewport: select_begin
#      0
#  viewport: select_end
#  #  # Save the current view state into the file
#  #      /usr/tmp/view1
#  view_transf: save_view /usr/tmp/view1
#  #  # You could now do other transformations etc...
#  #  # And then when you want to restore to the view state
#  # we saved, do the following
#  #  view_transf: restore_view /usr/tmp/view1
```

**See Also:**

Associated `view_transf` commands
view_transf: revolution##_of_points

Command:

`view_transf: revolution##_of_points <number_of>`

Purpose:

Defines the number of points on the revolution tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>number_of</td>
<td>number of points defined for the revolution tool</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
#   # Turns display of the quadric surface of revolution on
#   # (only one quadric tool at a time can be on)
#   tools: quadric revolution
#   # Sets the axis and other attributes of the revolution tool
#   view_transf: revolution_origin 0.500000 0.700000 1.000000
view_transf: revolution_axis 0.995040 0.099504 0.000000
view_transf: revolution##_of_points 7
view_transf: revolution_point 1 -1.250000 0.500000
view_transf: revolution_point 2 -0.625000 0.500000
view_transf: revolution_point 3 0.000000 1.000000
view_transf: revolution_point 4 0.301802 0.720000
view_transf: revolution_point 5 0.319820 0.710000
view_transf: revolution_point 6 0.625000 0.500000
view_transf: revolution_point 7 1.250000 0.500000
#   # Turns off the display of the revolution tool
#   tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: revolution_axis

Command:

\[ \text{view\_transf: revolution\_axis } <x\_comp> <y\_comp> <z\_comp> \]

Purpose:

Sets the axis for the revolution tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z directional components of the revolution tool axis</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Coordinates are in reference to the selected coordinate frame.

Example Usage:

```
# Turns display of the quadric surface of revolution on
# (only one quadric tool at a time can be on)
# tools: quadric revolution
# Sets the axis and other attributes of the revolution tool
view_transf: revolution_origin 0.500000 0.700000 1.000000
view_transf: revolution_axis 0.995040 0.099504 0.000000
view_transf: revolution_of_points 7
view_transf: revolution_point 1 -1.250000 0.500000
view_transf: revolution_point 2 -0.625000 0.500000
view_transf: revolution_point 3 0.000000 1.000000
view_transf: revolution_point 4 0.301802 0.720000
view_transf: revolution_point 5 0.319820 0.710000
view_transf: revolution_point 6 0.625000 0.500000
view_transf: revolution_point 7 1.250000 0.500000
# Turns off the display of the revolution tool
# tools: quadric none
```

See Also:

Associated view_transf commands
Command:

`view_transf: revolution_origin <x_coord> <y_coord> <z_coord>`

Purpose:

Sets the origin point for the first end of the revolution tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of 1st end of the revolution tool</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Coordinates are in reference to the selected coordinate frame.

Example Usage:

```
#  # Turns display of the quadric surface of revolution on
#  # (only one quadric tool at a time can be on)
#  #
tools: quadric revolution
#  # Sets the axis and other attributes of the revolution tool
#  #
view_transf: revolution_origin 0.500000 0.700000 1.000000
view_transf: revolution_axis 0.995040 0.099504 0.000000
view_transf: revolution_#_of_points 7
view_transf: revolution_point 1 -1.250000 0.500000
view_transf: revolution_point 2 -0.625000 0.500000
view_transf: revolution_point 3 0.000000 1.000000
view_transf: revolution_point 4 0.301802 0.720000
view_transf: revolution_point 5 0.319820 0.710000
view_transf: revolution_point 6 0.625000 0.500000
view_transf: revolution_point 7 1.250000 0.500000
#  # Turns off the display of the revolution tool
#  #
tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: revolution_point

Command:

```
view_transf: revolution_point <pt_number> <x_coord> <y_coord>
```

Purpose:

Defines the location of the given point in relation to the revolution axis.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>pt_number</td>
<td>revolution tool point number for which the coordinates are being given</td>
</tr>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x coordinate of the point on the revolution tool. Namely, the distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>parallel to the revolution axis from the origin of the tool</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td>y coordinate of the point on the revolution tool. Namely, the distance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>perpendicular to the revolution axis from the origin of the tool</td>
</tr>
</tbody>
</table>

Example Usage:

```
#  # Turns display of the quadric surface of revolution on  
#  # (only one quadric tool at a time can be on)  
#  #  
#  tools: quadric revolution  
#  #  
#  # Sets the axis and other attributes of the revolution tool  
#  
view_transf: revolution_origin 0.500000 0.700000 1.000000  
view_transf: revolution_axis 0.995040 0.099504 0.000000  
view_transf: revolution_#_of_points 7  
view_transf: revolution_point 1 -1.250000 0.500000  
view_transf: revolution_point 2 -0.625000 0.500000  
view_transf: revolution_point 3 0.000000 1.000000  
view_transf: revolution_point 4 0.301802 0.720000  
view_transf: revolution_point 5 0.319820 0.710000  
view_transf: revolution_point 6 0.625000 0.500000  
view_transf: revolution_point 7 1.250000 0.500000  
#  # Turns off the display of the revolution tool  
#  
tools: quadric none  
```

See Also:

Associated view_transf commands
Command:

view_transf: rotate <x_ang> <y_ang> <z_ang>

Purpose:

Specifies a rotation (in degrees about each of the axes). Used for global, frame, and tool transformations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_ang</td>
<td>number of degrees to rotate about the x,y,z axes. (sign is according to the right-hand rule)</td>
</tr>
<tr>
<td></td>
<td>y_ang</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_ang</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# Selecting viewport(s)
viewport: select_begin
2
viewport: select_end
#
# Set the axis to x
# and rotate about the x axis 15 degrees
#
view_transf: axis x
view_transf: rotate 15.000000 0.000000 0.000000
#
# Set the axis to be y
# and translate one unit in the -negative y direction
#
view_transf: axis y
view_transf: translate 0.0000e+00 -1.0000e+00 0.0000e+00
#
# Now showing it with a plane tool rotation
#
tools: plane ON
view_transf: function plane
view_transf: rotate 0.000000 -39.575481 0.000000
view_transf: function global
#
# And now with a local transformation
#
part: select_default
frame: create
frame: select_begin
1
frame: select_end
part: select_begin
1
part: select_end
```
view_transf: rotate

frame: assign 1
view_transf: function local
view_transf: axis y
view_transf: rotate 0.000000 27.000000 0.000000

See Also:

Associated view_transf commands
Command:

```
view_transf: save_view <filename>
```

Purpose:

Save the current view state into a file.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>filename</td>
<td>the name (including the path) of the file in which to save the view state</td>
</tr>
</tbody>
</table>

Example Usage:

```
#
# Select the viewport(s) desired
#
viewport: select_begin
0
viewport: select_end
#
# Save the current view state into the file
# /usr/tmp/view1
#
view_transf: save_view /usr/tmp/view1
#
# You could now do other transformations etc...
#
# And then when you want to restore to the view state
# we saved, do the following
#
view_transf: restore_view /usr/tmp/view1
```

See Also:

Associated `view_transf` commands
view_transf: scale

Command:

```
view_transf: scale <x_scale> <y_scale> <z_scale>
```

Purpose:

Defines a scaling in each of the axis directions. Used for global, frame, and tool transformation.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_scale</td>
<td>scale factor to apply to x, y, z coordinates</td>
</tr>
<tr>
<td></td>
<td>y_scale</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_scale</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# # Selecting viewport(s)
# viewport: select_begin
2
viewport: select_end
#
# Applying a global scaling
# (evenly in all directions)
#
view_transf: scale 1.2000e+00 1.2000e+00 1.2000e+00
#
# Now with a local transformation
# (Scaling only in the z direction)
#
frame: select_begin
1
frame: select_end
view_transf: function local
view_transf: scale 0.0000e+00 0.0000e+00 5.0000e+00
```

See Also:

Associated `view_transf` commands
Command:

```
view_transf: sphere_axis <x_comp> <y_comp> <z_comp>
```

Purpose:
Sets the axis components for the sphere tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_comp</td>
<td>x, y, z components of the sphere tool axis</td>
</tr>
<tr>
<td></td>
<td>y_comp</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_comp</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Coordinates are in reference to the selected coordinate frame.

Example Usage:
```
#   # Turns display of the quadric sphere tool on
#   # (only one quadric tool at a time can be on)
#   # tools: quadric sphere
#   # Sets the axis and other attributes of the sphere tool
#   view_transf: sphere_radius 1.500000
view_transf: sphere_axis 1.000000 0.100000 0.000000
view_transf: sphere_origin 0.500000 0.700000 1.000000
#   # Turns off the display of the sphere tool
#   # tools: quadric none
```

See Also:
Associated `view_transf` commands
**Command:**

```plaintext
view_transf: sphere_origin <x_coord> <y_coord> <z_coord>
```

**Purpose:**

Sets the origin point for the first end of the sphere tool.

**Parameters:**

```
<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>x_coord</td>
<td>x, y, z coordinates of 1st end of the sphere tool</td>
</tr>
<tr>
<td></td>
<td>y_coord</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_coord</td>
<td></td>
</tr>
</tbody>
</table>
```

**Notes:**

Coordinates are in reference to the selected coordinate frame.

**Example Usage:**

```plaintext
# # Turns display of the quadric sphere tool on  # (only one quadric tool at a time can be on)  # tools: quadric sphere  # # Sets the origin and other attributes of the sphere tool  #  view_transf: sphere_radius 1.500000  view_transf: sphere_axis 1.000000 0.100000 0.000000  view_transf: sphere_origin 0.500000 0.700000 1.000000  # # Turns off the display of the sphere tool  # tools: quadric none
```

**See Also:**

Associated `view_transf` commands
Command:

`view_transf: sphere_radius <value>`

Purpose:

Defines the radius of the sphere tool.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>radius of the sphere tool</td>
</tr>
</tbody>
</table>

Example Usage:

```bash
# Turns display of the quadric sphere tool on
# (only one quadric tool at a time can be on)
#
tools: quadric sphere
#
# Sets the axis and other attributes of the sphere tool
#
view_transf: sphere_radius 1.500000
view_transf: sphere_axis 1.000000 0.100000 0.000000
view_transf: sphere_origin 0.500000 0.700000 1.000000
#
# Turns off the display of the sphere tool
#
tools: quadric none
```

See Also:

Associated `view_transf` commands
view_transf: spin

Command:

```
view_transf: spin <num> <x_ang> <y_ang> <z_ang>
```

Purpose:
Applies a global rotation multiple times.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of times that the rotation is to be applied</td>
</tr>
<tr>
<td>float</td>
<td>x_ang</td>
<td>number of degrees to rotate about the x, y, z axes. (sign is according to the right-hand rule)</td>
</tr>
<tr>
<td></td>
<td>y_ang</td>
<td></td>
</tr>
<tr>
<td></td>
<td>z_ang</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
Interactively, the model will continue to spin until the user stops it. Once stopped, the command language contains the number of times the rotation was applied.

Example Usage:

```
# # Selecting viewport(s)
#
viewport: select_begin
2
viewport: select_end
#
# Spin only works with global rotations
#
view_transf: function global
#
# Apply the rotation specified
# (In this case, 105 times)
#
view_transf: spin 105 0.602679 -10.175333 0.000000
```

See Also:
Associated view_transf commands
Command:

\texttt{view\_transf: \textit{translate} <x\_dist> <y\_dist> <z\_dist>}

Purpose:

Specifies a translation in each of the coordinate directions. Used for global, frame, and tool transformations.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>\textit{x_dist}</td>
<td>distance to translate in the \textit{x}, \textit{y}, \textit{z} directions</td>
</tr>
<tr>
<td></td>
<td>\textit{y_dist}</td>
<td></td>
</tr>
<tr>
<td></td>
<td>\textit{z_dist}</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```plaintext
#
# Sets the function to cursor mode
# and translates the cursor
#
view\_transf: function cursor
view\_transf: translate 0.295634 -0.014792 -0.144601
#
# Return to global transformation mode
#
view\_transf: function global
#
# Does some global transformations
# (one of which is a translate)
#
view\_transf: zoom 1.431051
view\_transf: rotate -1.071430 21.547768 0.000000
view\_transf: translate 0.620558 0.000000 0.000000
#
# Sets Frame transform mode (local)
#
view\_transf: function local
#
# Selects the viewport and frame to use
#
viewport: select\_begin
3
viewport: select\_end
frame: select\_begin
1
frame: select\_end
#
# And translate the parts attached to frame 1
#
view\_transf: translate 0.0000E+00 -4.0000e+00 0.0000e+00
#
# Return to global transformation mode
```
view_transf: translate

#

view_transf: function global

See Also:

Associated view_transf commands
**Command:**

```
view_transf: undo
```

**Purpose:**

Undo the last transformation or tool definition.

**Parameters:**

none

**Example Usage:**

```
view_transf: function global
view_transf: rotate 2.510301e+01 7.117291e+01 0.000000e+00
view_transf: undo
view_transf: redo
```

**See Also:**

Associated `view_transf` commands
view_transf: view_recall

Command:

`view_transf: view_recall <option>`

Purpose:

View the model from a standard (or customized) view position.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>F5 right side view (or a custom view if so saved)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F6 top view (or a custom view if so saved)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F7 front view (or a custom view if so saved)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F8 previous view (or a custom view if so saved)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+X from the positive x direction toward the origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+Y from the positive y direction toward the origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+Z from the positive z direction toward the origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-X from the negative x direction toward the origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Y from the negative y direction toward the origin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>-Z from the negative z direction toward the origin</td>
</tr>
</tbody>
</table>

Notes:

The F5, F6, F7 views have standard right, top, and front views for a default. These can be altered by the user using the "view_transf: view_store" command. Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```bash
# Select viewport for which you wish
# to modify the view
# viewport: select_begin
1
viewport: select_end
viewport: select_begin
2
view_transf: view_recall F5
#
# Selecting a different viewport
# to show another example
#
viewport: select_begin
2
viewport: select_end
view_transf: view_recall +Y
```

See Also:

Associated `view_transf` commands
Command:

```
view_transf: view_store <option>
```

Purpose:
Stores a current View state as a state attached to one of the four customizable function keys.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>F5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>F8</td>
</tr>
</tbody>
</table>

Notes:

The F5, F6, F7 views have standard right, top, and front views for a default. These can be altered by the user using this command. The views stored here can be recalled using the "view_transf: view_recall" command.

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# # Select viewport that contains the
# view that you wish to store.
# viewport: select_begin
1
viewport: select_end
#
# Store it into the desired F key
# view_transf: view_store F5
```

See Also:

Associated `view_transf` commands
view_transf: viewport_link

Command:

```
view_transf: viewport_link <toggle>
```

Purpose:

Link the interactive global transformations of multiple viewports. This causes any transformations applied to one of the viewports to be applied to all the other linked viewports as well.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to link all currently selected viewports</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to unlink all currently selected viewports</td>
</tr>
</tbody>
</table>

Notes:

Only interactive transforms are linked.

Example Usage:

```
# Selecting three viewports, and linking them
viewport: select_begin
0 1 2
viewport: select_end
view_transf: viewport_link ON
```

See Also:

Associated `view_transf` commands
Command:
```
view_transf: viewport_state_copy
```

Purpose:
Save the transformation state of the currently selected viewport (for the purpose of applying it to a different viewport with the "view_transf: viewport_state_paste" command.

Parameters:
none

Example Usage:
```
# Select viewport for which you wish
# to save the transformation state
#
viewport: select_begin
1
viewport: select_end
view_transf: viewport_state_copy
#
# Select the viewport you wish to
# apply this state to
#
viewport: select_begin
2
viewport: select_end
view_transf: viewport_state_paste
```

See Also:
Associated `view_transf` commands
view_transf: zclip_back/front

Command:

```
view_transf: zclip_back <z_loc>
view_transf: zclip_front <z_loc>
```

Purpose:

Sets the position of the back/front z-clip plane

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>z_loc</td>
<td>z coordinate of the back/front z-clipping plane</td>
</tr>
</tbody>
</table>

Notes:

This value is used only when "view_transf: zclip_float" is OFF. Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# # Select viewport
#
viewport: select_begin
1
viewport: select_end
#
# Set z-clip float OFF and set the location
# the front and back clipping planes
#
view_transf: zclip_float OFF
view_transf: zclip_front 7.2296e+00
view_transf: zclip_back 3.5459e+01
```

See Also:

Associated view_transf commands
Command:

\texttt{\textit{view\_transf: zclip\_float <toggle>}}

Purpose:

Sets the z-clipping state. The front and back z-clipping planes can "float" so that they are always outside the model - causing no z-clipping to occur, or they can be set once initially and are then subject to manual modification.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON to have the z-clip planes float near, but outside the model z extents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF to be able to manually set front and back z-clipping plane locations</td>
</tr>
</tbody>
</table>

Notes:

Since the z-buffer uses the resolution between the front and back clipping planes, it is desirable to have these planes "near" the model. However, unless you specifically want to perform z-clipping, these by default "float" as needed to avoid any z-clipping. If you want z-clipping control, you can turn this "floating" behavior off and set the front and back plane locations yourself. During the float mode, near clipping will occur if it must be at the specified minimum z-clip location. A minimum is needed to avoid z reflection. Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```plaintext
# Select viewport
# viewport: select_begin
1
viewport: select_end
#
# Set z-clip float OFF and set the location of the front and back clipping planes
#
view_transf: zclip_float OFF
view_transf: zclip_front 7.2296e+00
view_transf: zclip_back 3.5459e+01
#
# To have them float instead
#
view_transf: zclip_float ON
view_transf: zclip_min 4.00000e-04
```

See Also:

Associated \texttt{view\_transf} commands
view_transf: zclip_min

Command:

```
view_transf: zclip_min <z_min>
```

Purpose:

Sets the minimum to which the front z-clipping plane is allowed to "float".

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>z_min</td>
<td>minimum allowable z location for the front z-clipping plane</td>
</tr>
</tbody>
</table>

Notes:

Since the z-buffer uses the resolution between the front and back clipping planes, it is desirable to have these planes "near" the model. However, unless you specifically want to perform z-clipping, these by default "float" as needed to avoid any z-clipping. If you want z-clipping control, you can turn this "floating" behavior off and set the front and back plane locations yourself. During the float mode, near clipping will occur if it must be at the specified minimum z-clip location. A minimum is needed to avoid z reflection. Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
# # Select viewport
# viewport: select_begin
1
viewport: select_end
#
# Set z-clip float OFF and set the location
# of the front and back clipping planes
#
view_transf: zclip_float OFF
view_transf: zclip_front 7.2296e+00
view_transf: zclip_back 3.5459e+01
#
# To have them float instead
# (note the minimum being set)
#
view_transf: zclip_float ON
view_transf: zclip_min 4.00000e-04
```

See Also:

Associated view_transf commands
Command:

```
view_transf: zoom <factor>
```

Purpose:

Move the viewer closer or farther away.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>factor</td>
<td>amount of zoom scaling</td>
</tr>
</tbody>
</table>

Notes:

Since transformations can be different per viewport, this can be set for each viewport, thus a viewport selection is needed if more than one viewport is being used.

Example Usage:

```
#
# Selecting viewport(s)
#
viewport: select_begin
2
viewport: select_end
#
# Applying a zoom factor
#
view_transf: zoom 1.431051
```

See Also:

Associated `view_transf` commands
view_transf: zoom_style

Command:

\texttt{view\_transf: zoom\_style \langle style\rangle}

Purpose:

Select the zoom user interaction style.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>style</td>
<td>automatic_slide will continue to zoom as long as mouse button is down</td>
</tr>
<tr>
<td></td>
<td></td>
<td>manual_drag will zoom only when the mouse is dragged</td>
</tr>
</tbody>
</table>

Example Usage:

\texttt{view\_transf: zoom\_style automatic\_slide}

See Also:

Associated view\_transf commands
Commands in this Section:

viewport

viewport: background_type <type>
viewport: blend_editlevel <level_num>
viewport: blend_levels <num>
viewport: blend_position <position>
viewport: blend_rgb <red_val> <grn_val> <blu_val>
viewport: border_rgb <red_val> <grn_val> <blu_val>
viewport: border_visible <toggle>
viewport: constant_rgb <red_val> <grn_val> <blu_val>
viewport: delete
viewport: height <height>
viewport: hidden_line <toggle>
viewport: hidden_surface <toggle>
viewport: lower
viewport: new
viewport: origin_x <coord>
viewport: origin_y <coord>
viewport: perspective <toggle>
viewport: raise
viewport: select_all
viewport: select_begin
viewport: select_end
viewport: select_default
viewport: viewport_dimension <option>
viewport: viewport_layout <option>
viewport: visible <toggle>
viewport: width <width>

See Also:

User Manual - Section 8.4, VPort Mode
How To Define and Change Viewports
viewport: background_type

Command:

viewport: background_type <type>

Purpose:

Specify the type of background to be displayed for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>type</td>
<td>the following types are applied to the selected viewports</td>
</tr>
<tr>
<td>blended</td>
<td></td>
<td>blend the background color between the specified colors between each specified level</td>
</tr>
<tr>
<td>constant</td>
<td></td>
<td>color the background a constant color (default)</td>
</tr>
<tr>
<td>inherit</td>
<td></td>
<td>inherits the background color of the main viewport, (viewport 0), i.e. the main view's background color shows through</td>
</tr>
</tbody>
</table>

Example Usage:

viewport: select_begin
  0
viewport: select_end
viewport: background_type blended
viewport: blend_levels 3
viewport: blend editlevel 1
viewport: blend_rgb 1.0000e+00 1.0000e+00 1.0000e+00
viewport: blend editlevel 2
viewport: blend_rgb 0.0000e+00 0.0000e+00 1.0000e+00
viewport: blend editlevel 3
viewport: blend_position 3.2000e-01
viewport: blend_rgb 0.0000e+00 0.0000e+00 0.0000e+00
viewport: select_begin
  1
viewport: select_end
viewport: background_type inherit
viewport: select_begin
  2
viewport: select_end
viewport: background_type constant
viewport: constant_rgb 0.0000e+00 0.0000e+00 0.0000e+00

See Also:

Associated viewport commands
Command:

```
viewport: blend_editlevel <level_num>
```

Purpose:

Specify the level to edit of the corresponding blended background type for the selected viewport(s), i.e. used to edit either the position or color of the level.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>level_num</td>
<td>specified level number for the blended background type</td>
</tr>
</tbody>
</table>

Example Usage:

```
viewport: select_begin
0
viewport: select_end
viewport: background_type blended
viewport: blend_levels 3
viewport: blend_editlevel 1
viewport: blend_rgb 1.0000e+00 1.0000e+00 1.0000e+00
viewport: blend_editlevel 2
viewport: blend_rgb 0.0000e+00 0.0000e+00 1.0000e+00
viewport: blend_editlevel 3
viewport: blend_position 3.2000e-01
viewport: blend_rgb 0.0000e+00 0.0000e+00 0.0000e+00
```

See Also:

Associated viewport commands
viewport: blend_levels

Command:

    viewport: blend_levels <num>

Purpose:

Specify the number of (vertical) levels of the corresponding blended background type for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>number of levels in $[1,n]$ for the blended background type</td>
</tr>
</tbody>
</table>

Example Usage:

    viewport: select_begin
    0
    viewport: select_end
    viewport: blend_levels 3

See Also:

Associated viewport commands
Command:

```plaintext
viewport: blend_position <position>
```

Purpose:

Specify the position of the specified blend level of the corresponding blended background type for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>position</td>
<td>normalized position in [0,1] for the blended background level</td>
</tr>
</tbody>
</table>

Notes:

- Blend level 0 must be located at 0.
- Blend level N must be located at 1.
- Blend level N must be > N-1.

Example Usage:

```plaintext
viewport: select_begin
0
viewport: select_end
viewport: background_type blended
viewport; blend_levels 3
viewport: blend_editlevel 2
viewport: blend_position 3.2000e-01
viewport: blend_rgb 0.0000e+00 0.0000e+00 1.0000e+00
```

See Also:

Associated `viewport` commands
viewport: blend_rgb

Command:

    viewport: blend_rgb <red_val> <grn_val> <blu_val>

Purpose:

Specify the red, green and blue components of the blended background color for the specified level of the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color component values given in [0.,1.]</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

    viewport: select_begin
    0
    viewport: select_end
    viewport: background_type blended
    viewport; blend_levels 3
    viewport: blend_editlevel 2
    viewport: blend_position 3.2000e-01
    viewport: blend_rgb 0.0000e+00 0.0000e+00 1.0000e+00

See Also:

Associated viewport commands
Command:

```
viewport: border_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Set the color for the viewport border.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color component values given in [0,1]</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Notes:

By default the border color is white.

**Used only if viewport: border_visible is ON.**

Example Usage:

```
viewport: select_begin
1
viewport: select_end
viewport: border_rgb 1. 0. 1.
```

See Also:

Associated viewport commands
viewport: border_visible

Command:

viewport: border_visible <toggle>

Purpose:

Set visibility of viewport border.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON for visible border</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF for invisible border</td>
</tr>
</tbody>
</table>

Notes:

Viewport borders are on by default.

Example Usage:

viewport: select_begin
viewport: select_end
viewport: border_visible OFF

See Also:

Associated viewport commands
Command:

`viewport: constant_rgb <red_val> <grn_val> <blu_val>`

Purpose:
Specify the red, green and blue components of the constant background color for the selected viewport(s)

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color component values given in [0.,1.]</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
viewport: select_begin
  2
viewport: select_end
viewport: background_type constant
viewport: constant_rgb 0.0000e+00 0.0000e+00 0.0000e+00
```

See Also:

Associated `viewport` commands
viewport: delete

Command:

```plaintext
viewport: delete
```

Purpose:

Delete all selected viewports.

Parameters:

none

Notes:

After selected viewports have been deleted, the main viewport (0) will be selected.

The main viewport (0) can not be deleted.

Example Usage:

```plaintext
viewport: select_begin
  2 5
viewport: select_end
viewport: delete
viewport: select_begin
  0
viewport: select_end
```

See Also:

Associated `viewport` commands
Command:

```
viewport: height <height>
```

Purpose:

Specify the normalized height for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>height</td>
<td>normalized height ([0.,1.])</td>
</tr>
</tbody>
</table>

Example Usage:

```
viewport: select_begin 0
viewport: select_end
viewport: origin_x 3.3333e-01
viewport: origin_y 0.0000e+00
viewport: width 5.1712e-01
viewport: height 1.0000e+00
viewport: select_begin 1 2
viewport: select_end
viewport: height 2.5000e-01
```

See Also:

Associated `viewport` commands
viewport: hidden_line

Command:

    viewport: hidden_line <toggle>

Purpose:

Toggle whether hidden line meshes are to be overlaid onto parts in active viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

A part will be displayed with hidden lines if:

(a) view: hidden-line ON

(b) viewport: hidden_line ON

(c) part: hidden_line ON

Example Usage:

    viewport: select_begin
    0
    viewport: select_end
    viewport: hidden_line OFF
    viewport: select_begin
    1
    viewport: select_end
    viewport: hidden_line ON

See Also:

Associated viewport commands
Command:

`viewport: hidden_surface <toggle>`

Purpose:

Toggle whether hidden surfaces are to be removed from parts in active viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

A part will be displayed with shading if:

(a) `view: hidden-surface ON`

(b) `viewport: hidden_surface ON`

(c) `part: hidden_surface ON`

Example Usage:

```plaintext
viewport: select_begin
0
viewport: select_end
viewport: hidden_surface OFF
viewport: select_begin
1
viewport: select_end
viewport: hidden_surface ON
```

See Also:

Associated `viewport` commands
viewport: lower

Command:

viewport: lower

Purpose:

Lower the selected viewport(s) to be located beneath all the other viewports - except the main viewport.

Parameters:

none

Notes:

The main viewport (0) always remains beneath all viewports; and thus, is neither raised or lowered.

Example Usage:

viewport: select_begin
  3 4
viewport: select_end
viewport: lower

See Also:

Associated viewport commands
Command:

```
viewport: new
```

Purpose:

Specify a new viewport to be created.

Parameters:

none

Notes:

New viewport indexing sequentially increments in the range [1,16].

Example Usage:

```
viewport: new
viewport: select_begin
1
viewport: select_end
```

See Also:

Associated viewport commands
viewport: origin_x/y

Command:

    viewport: origin_x <coord>
    viewport: origin_y <coord>

Purpose:

Specify the normalized x/y-coordinate value of the origin for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>coord</td>
<td>lower left/bottom of viewport with range [0,1]</td>
</tr>
</tbody>
</table>

Example Usage:

    viewport: select_begin 0
    viewport: select_end
    viewport: origin_x 3.3333e-01
    viewport: origin_y 0.0000e+00
    viewport: width 5.1712e-01
    viewport: height 1.0000e+00
    viewport: select_begin 1 2
    viewport: select_end
    viewport: origin_x 1.0000e-01

See Also:

Associated viewport commands
Command:

```plaintext
viewport: perspective <toggle>
```

Purpose:

Toggle whether viewing frustrum is to be perspective or orthographic in selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>one of following toggle values:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ON</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF</td>
</tr>
</tbody>
</table>

Notes:

Geometry will be shown with perspective if:

(a) `view: perspective ON`

(b) `viewport: perspective ON`

Example Usage:

```plaintext
viewport: select_begin
0
viewport: select_end
viewport: perspective OFF
viewport: select_begin
1
viewport: select_end
viewport: perspective ON
```

See Also:

Associated `viewport` commands
viewport: raise

Command:

viewport: raise

Purpose:

Specify the selected viewport(s) to be located above all the other viewports.

Parameters:

none

Notes:

The main viewport (0) always remains beneath all viewports; and thus, is neither raised or lowered.

Example Usage:

viewport: select_begin
2
viewport: select_end
viewport: raise

See Also:

Associated viewport commands
Command:

```
viewport: select_all
```

Purpose:
Select all created viewports for editing.

Parameters:

```
none
```

Example Usage:

```
viewport: select_all
```

See Also:

Associated `viewport` commands
viewport: select_begin/end

Command:

viewport: select_begin
  <id1 id2 ...idn>
viewport: select_end

Purpose:

Set active viewport(s) selection construct for subsequent viewport modification.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>idn</td>
<td>list of viewport number(s) to be active for editing.</td>
</tr>
</tbody>
</table>

Notes:

All other "viewport:" commands operate off this setting.

Example Usage:

viewport: select_begin
  0
viewport: select_end
view_trans: function global
viewport: viewport_layout two_vertical
viewport: select_begin
  1 2
viewport: select_end

See Also:

Associated viewport commands
Command:

viewport: select_default

Purpose:

Allows the setting of default viewport attributes prior to creating the next viewport.

Parameters:

none

Example Usage:

viewport: select_default
viewport: perspective OFF
viewport: background_type constant
viewport: constant_rgb 0.0000e+00 0.0000e+00 0.0000e+00

See Also:

Associated viewport commands
viewport: viewport_dimension

Command:

    viewport: viewport_dimension <option>

Purpose:

Set the dimension of the viewport.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>includes the following viewport dimensions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3D (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2D</td>
</tr>
</tbody>
</table>

Notes:

Dimension 2D is handy for displaying 2D clips and/or developed surfaces.

A 2D viewport can only be transformed in 2D.

Example Usage:

    viewport: select_begin
    0 1
    viewport: select_end
    viewport: viewport_dimension 3D
    viewport: select_begin
    2
    viewport: select_end
    viewport: viewport_dimension 2D

See Also:

Associated viewport commands
Command:

viewport: viewport_layout <option>

Purpose:

Specify the type of layout to be used in dividing the graphics window into viewports.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>includes the following types of viewport layouts:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>one</td>
</tr>
<tr>
<td></td>
<td></td>
<td>two_vertical</td>
</tr>
<tr>
<td></td>
<td></td>
<td>two_horizontal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>four_equal</td>
</tr>
<tr>
<td></td>
<td>four_withthreeleft</td>
<td>Three viewports on left + one large</td>
</tr>
<tr>
<td></td>
<td>four_withthreebottom</td>
<td>Three viewports on bottom + one large</td>
</tr>
</tbody>
</table>

Notes:

When creating a layout of viewports, the active viewport defaults to the last viewport created, i.e. if creating `four_equal` viewports, the active viewport is the last of the four created.

Example Usage:

viewport: select_begin
0
viewport: select_end
view_trans: function global
viewport: viewport_layout two_vertical
viewport: select_begin
1
viewport: select_end

See Also:

Associated `viewport` commands
viewport: visible

Command:

viewport: visible <toggle>

Purpose:

Toggle whether selected viewports are visible.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON viewport is visible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF viewport is not visible</td>
</tr>
</tbody>
</table>

Example Usage:

viewport: select_begin
0
viewport: select_end
viewport: visible OFF
viewport: select_begin
1
viewport: select_end
viewport: visible ON

See Also:

Associated viewport commands
Command:

viewport: width <width>

Purpose:

Specify the normalized width for the selected viewport(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>width</td>
<td>normalized width [0.,1.]</td>
</tr>
</tbody>
</table>

Example Usage:

viewport: select_begin
0
viewport: select_end
viewport: origin_x 3.3333e-01
viewport: origin_y 0.0000e+00
viewport: width 5.1712e-01
viewport: height 1.0000e+00
viewport: select_begin
1 2
viewport: select_end
viewport: width 2.5000e-01

See Also:

Associated viewport commands
viewport: width
Commands in this Section:

**viewport_bounds**

- `viewport_bounds: auto_size <toggle>`
- `viewport_bounds: axis_linewidth <line_width>`
- `viewport_bounds: axis_rgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: axis_x_format <format>`
- `viewport_bounds: axis_y_format <format>`
- `viewport_bounds: axis_z_format <format>`
- `viewport_bounds: axis_x_gridextentloc <extent>`
- `viewport_bounds: axis_y_gridextentloc <extent>`
- `viewport_bounds: axis_z_gridextentloc <extent>`
- `viewport_bounds: axis_x_gridtype <grid_type>`
- `viewport_bounds: axis_y_gridtype <grid_type>`
- `viewport_bounds: axis_z_gridtype <grid_type>`
- `viewport_bounds: axis_x_labelaxisloc <label_location>`
- `viewport_bounds: axis_y_labelaxisloc <label_location>`
- `viewport_bounds: axis_z_labelaxisloc <label_location>`
- `viewport_bounds: axis_x_labelextentloc <extent>`
- `viewport_bounds: axis_y_labelextentloc <extent>`
- `viewport_bounds: axis_z_labelextentloc <extent>`
- `viewport_bounds: axis_x_labelrgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: axis_y_labelrgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: axis_z_labelrgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: axis_x_min <min>`
- `viewport_bounds: axis_x_max <max>`
- `viewport_bounds: axis_y_min <min>`
- `viewport_bounds: axis_y_max <max>`
- `viewport_bounds: axis_z_min <min>`
- `viewport_bounds: axis_z_max <max>`
- `viewport_bounds: axis_x_numgrid <num>`
- `viewport_bounds: axis_y_numgrid <num>`
- `viewport_bounds: axis_z_numgrid <num>`
- `viewport_bounds: axis_x_numsubgrid <num>`
- `viewport_bounds: axis_y_numsubgrid <num>`
- `viewport_bounds: axis_z_numsubgrid <num>`
- `viewport_bounds: axis_x_sgridtype <grid_type>`
- `viewport_bounds: axis_y_sgridtype <grid_type>`
- `viewport_bounds: axis_z_sgridtype <grid_type>`
- `viewport_bounds: dimension <dimension>`
- `viewport_bounds: grid_linetype <line_type>`
- `viewport_bounds: grid_linewidth <width>`
- `viewport_bounds: grid_rgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: length <size_option>`
- `viewport_bounds: subgrid_linetype <line_type>`
- `viewport_bounds: subgrid_linewidth <width>`
- `viewport_bounds: subgrid_rgb <red_val> <grn_val> <blu_val>`
- `viewport_bounds: transparency <value>`
- `viewport_bounds: visible <toggle>`
viewport_bounds

See Also:

User Manual - Chapter 8, Part Bounds Attributes
viewport_bounds: auto_size

Command:

viewport_bounds: auto_size <toggle>

Purpose:

When geometry changes the bounds display will resize if this toggle is set

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON resize the bounds when the geometry changes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF do not resize the bounds</td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: auto_size OFF
```

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_linewidth

Command:

```
viewport_bounds: axis_linewidth <line_width>
```

Purpose:

Set the line width for the bounds axis

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>line_width</td>
<td>the pixel width for the axis</td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: axis_linewidth 2
viewport_bounds: axis_rgb 1.0000e+00 0.0000e+00 1.0000e+00
```

See Also:

Associated `viewport_bounds` commands
Command:

```plaintext
viewport_bounds: axis_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Set the color for the bounds axis

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components (must be between 0.0 and 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: axis_linewidth 1
viewport_bounds: axis_rgb 1.0000e+00 0.0000e+00 1.0000e+00
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: axis_x/y/z_format

Command:

viewport_bounds: axis_x_format <format>
viewport_bounds: axis_y_format <format>
viewport_bounds: axis_z_format <format>

Purpose:

Specifies the format to be used for labels along the x/y/z axis

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>format</td>
<td>may be any valid C language format string</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_x_format %.2f
viewport_bounds: axis_y_format %g
```

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_gridextentloc

Command:

viewport_bounds: axis_x_gridextentloc <extent>
viewport_bounds: axis_y_gridextentloc <extent>
viewport_bounds: axis_z_gridextentloc <extent>

Purpose:

Specifies which bounds will receive grids and subgrid lines

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>extent</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min: draw the grid/subgrid lines for the minimum axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max: draw the grid/subgrid lines for the maximum axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>both: draw the grid/subgrid lines for both the min and max axis</td>
</tr>
</tbody>
</table>

Example Usage:

view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_x_gridextentloc both
viewport_bounds: axis_y_gridextentloc min
viewport_bounds: axis_z_gridextentloc max

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_gridtype

Command:

viewport_bounds: axis_x_gridtype <grid_type>
viewport_bounds: axis_y_gridtype <grid_type>
viewport_bounds: axis_z_gridtype <grid_type>

Purpose:

Set the line type for the x/y/z grid bounds

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>grid_type</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specifies no grid lines</td>
</tr>
<tr>
<td></td>
<td></td>
<td>grid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specifies a solid grid line</td>
</tr>
<tr>
<td></td>
<td></td>
<td>tick</td>
</tr>
<tr>
<td></td>
<td></td>
<td>specifies tick marks only</td>
</tr>
</tbody>
</table>

Notes:

If grid, the line type is specified via the viewport_bounds: grid_linetype command

Example Usage:

view: bounds ON
viewport: select_begin
0
viewport: select_end
viewport_bounds: axis_x_gridtype solid
viewport_bounds: axis_y_gridtype none
viewport_bounds: axis_z_gridtype tick
viewport_bounds: grid_linetype solid

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_labelaxisloc

Command:

viewport_bounds: axis_x_labelaxisloc <label_location>
viewport_bounds: axis_y_labelaxisloc <label_location>
viewport_bounds: axis_z_labelaxisloc <label_location>

Purpose:

Specifies the location for the x/y/z axis labels for bounds display

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>label_location</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>none do not display labels along this axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>all display all of the labels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>beg_end display only the labels for the first and last grid</td>
</tr>
</tbody>
</table>

Notes:

When label_location is "all", the number of labels is controlled by the viewport_bounds: axis_x/y/z_numgrid command

Example Usage:

```plaintext
view: bounds ON
viewport: select_begin 0
viewport: select_end
viewport_bounds: length as_specified
viewport_bounds: axis_x_min 0.
viewport_bounds: axis_x_max 1.
viewport_bounds: axis_x_numgrid 5
viewport_bounds: axis_x_labelaxisloc beg_end
```

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_labelextentloc

Command:

viewport_bounds: axis_x_labelextentloc <extent>
viewport_bounds: axis_y_labelextentloc <extent>
viewport_bounds: axis_z_labelextentloc <extent>

Purpose:

Specifies which bounds axis will receive labels

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>extent</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>min: label the grid marks for the minimum axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>max: label the grid marks for the maximum axis</td>
</tr>
<tr>
<td></td>
<td></td>
<td>both: label both the minimum and maximum axis</td>
</tr>
</tbody>
</table>

Example Usage:

view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_x_labelextentloc both
viewport_bounds: axis_y_labelextentloc min
viewport_bounds: axis_z_labelextentloc max

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_labelrgb

Command:

viewport_bounds: axis_x_labelrgb <red_val> <grn_val> <blu_val>
viewport_bounds: axis_y_labelrgb <red_val> <grn_val> <blu_val>
viewport_bounds: axis_z_labelrgb <red_val> <grn_val> <blu_val>

Purpose:

Set the color for the x/y/z axis labels

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components (must be between 0.0 and 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

view: bounds ON
viewport: select_begin
0
viewport: select_end
viewport_bounds: axis_x_labelrgb 4.0000e-01 0.0000e+00 1.0000e+00

See Also:

Associated viewport_bounds commands
viewport_bounds: axis_x/y/z_min/max

Command:

```
viewport_bounds: axis_x_min <min>
viewport_bounds: axis_x_max <max>
viewport_bounds: axis_y_min <min>
viewport_bounds: axis_y_max <max>
viewport_bounds: axis_z_min <min>
viewport_bounds: axis_z_max <max>
```

Purpose:

Sets the minimum value for the x/y/z axis

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>min</td>
<td>the minimum axis value</td>
</tr>
<tr>
<td></td>
<td>max</td>
<td>the maximum axis value</td>
</tr>
</tbody>
</table>

Notes:

If the length attribute is set to rounded the resulting min/max x/y/z value will be modified from the specified value

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_linewidth 1
viewport_bounds: axis_rgb 1.0000e+00 0.0000e+00 1.0000e+00
viewport_bounds: length as_specified
viewport_bounds: axis_x_min 0.2
viewport_bounds: axis_x_max 0.6
viewport_bounds: axis_y_min 0.0
viewport_bounds: axis_y_max 1.0
viewport_bounds: axis_z_min -1.
viewport_bounds: axis_z_max 1.
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: axis_x/y/z_numgrid

Command:

viewport_bounds: axis_x_numgrid <num>
viewport_bounds: axis_y_numgrid <num>
viewport_bounds: axis_z_numgrid <num>

Purpose:

Set the number of grid marks along the x/y/z axis

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>the number of grid marks to be used</td>
</tr>
</tbody>
</table>

Notes:

If the length attribute is set to rounded the resulting number of grid marks will be modified from the specified value.

Example Usage:

view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_linewidth 1
viewport_bounds: axis_rgb 1.0000e+00 0.0000e+00 1.0000e+00
viewport_bounds: length as_specified
viewport_bounds: axis_x_numgrid 5
viewport_bounds: axis_y_numgrid 3
viewport_bounds: axis_z_numgrid 7

See Also:

Associated viewport_bounds commands
**viewport_bounds: axis_x/y/z_numsubgrid**

**Command:**

```
viewport_bounds: axis_x_numsubgrid <num>
viewport_bounds: axis_y_numsubgrid <num>
viewport_bounds: axis_z_numsubgrid <num>
```

**Purpose:**

Set the number of subgrid marks along the x/y/z axis

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>num</td>
<td>the number of subgrid marks to be used</td>
</tr>
</tbody>
</table>

**Notes:**

If the length attribute is set to `rounded`, the resulting number of subgrid marks will be modified from the specified value.

**Example Usage:**

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: length as_specified
viewport_bounds: axis_x_numsubgrid 2
viewport_bounds: axis_y_numsubgrid 2
viewport_bounds: axis_z_numsubgrid 3
```

**See Also:**

Associated `viewport_bounds` commands
**viewport_bounds: axis_x/y/z_sgridtype**

**Command:**

```plaintext
viewport_bounds: axis_x_sgridtype <grid_type>
viewport_bounds: axis_y_sgridtype <grid_type>
viewport_bounds: axis_z_sgridtype <grid_type>
```

**Purpose:**

Set the line type for the x/y/z subgrid bounds

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>grid_type</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>specifies no grid lines</td>
</tr>
<tr>
<td></td>
<td>grid</td>
<td>specifies a solid grid line</td>
</tr>
<tr>
<td></td>
<td>tick</td>
<td>specifies tick marks only</td>
</tr>
</tbody>
</table>

**Notes:**

If “grid”, the line type is specified via the `viewport_bounds: subgrid_linetype` command

**Example Usage:**

```plaintext
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: axis_x_sgridtype solid
viewport_bounds: axis_y_sgridtype none
viewport_bounds: axis_z_sgridtype tick
viewport_bounds: subgrid_linetype solid
```

**See Also:**

Associated `viewport_bounds` commands
 viewport_bounds: dimension

Command:

viewport_bounds: dimension <dimension>

Purpose:
Set the bounds display to 2D or 3D.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>dimension</td>
<td>2D</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3D</td>
</tr>
</tbody>
</table>

Notes:
The 2D option is only available for 2D viewports and 3D viewports display in orthographic mode.

Example Usage:

```plaintext
# turn on bounds display and make the bounds for
# viewport 0 2D
#
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: dimension 2D
```

See Also:
Associated viewport_bounds commands
Command:

```
viewport_bounds: grid_linetype <line_type>
```

Purpose:

Specifies the type of grid lines that will be drawn for bounds display.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>line_type</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dash</td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: grid_linewidth 2
viewport_bounds: grid_linetype dotted
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: grid_linewidth

Command:

`viewport_bounds: grid_linewidth <width>`

Purpose:

Set the bounds axis grid line width

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>specifies the width in pixels</td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: grid_linewidth 2
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: grid_rgb

Command:

\[ \text{viewport_bounds: grid_rgb } \text{<red_val> } \text{<grn_val> } \text{<blu_val>} \]

Purpose:

Set the color for the bounds grid lines

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components (must be between 0.0 and 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: grid_linewidth 2
viewport_bounds: grid_rgb 0.5 1 0
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: length

Command:

    viewport_bounds: length <size_option>

Purpose:

Use min/max information as specified or use round numbers

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>size_option</td>
<td>as_specified</td>
</tr>
<tr>
<td></td>
<td></td>
<td>use the min/max values for the axis and number of tick/subticks as specified</td>
</tr>
<tr>
<td>rounded</td>
<td></td>
<td>rounded</td>
</tr>
<tr>
<td></td>
<td></td>
<td>use the min/max values specified to produce round numbers. Also round the number of ticks/subticks.</td>
</tr>
</tbody>
</table>

Example Usage:

    view: bounds ON
    viewport: select_begin 0
    viewport: select_end
    viewport_bounds: visible ON
    viewport_bounds: axis_linewidth 1
    viewport_bounds: length as_specified

See Also:

Associated viewport_bounds commands
**Command:**

```
viewport_bounds: subgrid_linetype <line_type>
```

**Purpose:**

Specifies the type of subgrid lines that will be drawn for bounds display.

**Parameters:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>line_type</td>
<td>Can be any of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>solid</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dotted</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dash</td>
</tr>
</tbody>
</table>

**Example Usage:**

```
view: bounds ON
viewport: select_begin 0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: subgrid_linewidth 2
viewport_bounds: subgrid_linetype dotted
```

**See Also:**

Associated `viewport_bounds` commands
viewport_bounds: subgrid_linewidth

Command:

```
viewport_bounds: subgrid_linewidth <width>
```

Purpose:

Set the bounds axis subgrid line width

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>int</td>
<td>width</td>
<td>specifies the width in pixels</td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: subgrid_linewidth 2
```

See Also:

Associated viewport_bounds commands
viewport_bounds: subgrid_rgb

Command:

```
viewport_bounds: subgrid_rgb <red_val> <grn_val> <blu_val>
```

Purpose:

Set the color for the bounds subgrid lines

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>red_val</td>
<td>red, green, blue color components (must be between 0.0 and 1.0)</td>
</tr>
<tr>
<td></td>
<td>grn_val</td>
<td></td>
</tr>
<tr>
<td></td>
<td>blu_val</td>
<td></td>
</tr>
</tbody>
</table>

Example Usage:

```
view: bounds ON
viewport: select_begin
  0
viewport: select_end
viewport_bounds: visible ON
viewport_bounds: subgrid_linewidth 2
viewport_bounds: subgrid_rgb 0.5 0.5 0.5
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: transparency

Command:

    viewport_bounds: transparency <value>

Purpose:

Sets the opaqueness for the bounds display

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>value</td>
<td>opaqueness value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0 = completely transparent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 = completely opaque</td>
</tr>
</tbody>
</table>

Example Usage:

    view: bounds ON
    viewport: select_begin
    0
    viewport: select_end
    viewport_bounds: transparency 0.5

See Also:

Associated viewport_bounds commands
Command:

```plaintext
viewport_bounds: visible <toggle>
```

Purpose:

Turn on bounds display for a viewport

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>toggle</td>
<td>ON: turn bounds display on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>OFF: turn bounds display off</td>
</tr>
</tbody>
</table>

Example Usage:

```plaintext
# turn on bounds display but turn the bounds off for viewport 1
view: bounds ON
viewport: select_begin
1
viewport: select_end
viewport_bounds: visible OFF
```

See Also:

Associated `viewport_bounds` commands
viewport_bounds: visible
Commands in this Section:

vortexcore

- vortexcore: begin
- vortexcore: end
- vortexcore: create
- vortexcore: density <variable_name>
- vortexcore: method <algorithm>
- vortexcore: momentum <variable_name>
- vortexcore: ratio_of_spec_heat <name or value>
- vortexcore: select_default
- vortexcore: threshold <variable_name>
- vortexcore: threshold_filter <option>
- vortexcore: threshold_max <threshold_value>
- vortexcore: threshold_min <threshold_value>
- vortexcore: threshold_value <threshold_value>
- vortexcore: velocity <variable_name>

See Also:

User Manual - Section 7.19, Vortex Core Create/Update
How To Extract Vortex Cores
vortexcore: begin/end

Command:

vortexcore: begin
vortexcore: end

Purpose:

Delimit the modifications for vortexcore attributes.

Parameters:

None.

Notes:

These commands are used to set the attributes for a vortex core creation.

Example Usage:

```
# Specify the 3D parent part(s)
# from which to create the vortex cores
#
part: select_begin
  1
part: select_end
#
# Compute the vortex cores part
#
vortexcore: begin
vortexcore: end
vortexcore: create
#
# Now select the newly created vortex part
# for subsequent operations
#
part: select_begin
  5
part: select_end
```

See Also:

Associated vortexcore commands
**Command:**

vortexcore: create

**Purpose:**

Create a vortex core part with the currently defined attributes and the selected 3D parent parts.

**Parameters:**

None.

**Example Usage:**

```plaintext
#
# Specify the 3D parent part(s)
# from which to create the vortex cores
#
part: select_begin
  1
part: select_end
#
# Compute the vortex cores part
#
vortexcore: begin
vortexcore: end
vortexcore: create
#
# Now select the newly created vortex part
# for subsequent operations
#
part: select_begin
  5
part: select_end
```

**See Also:**

Associated vortexcore commands
vortexcore: density

Command:

vortexcore: density <variable_name>

Purpose:

Specify the density variable to use in creating/updating a vortex core part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>the name of the density variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name <Density> exists.

Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```en
variables: activate Density
vortexcore: select_default
part: modify_begin
vortexcore: density Density
part: modify_end
```

See Also:

Associated vortexcore commands
Command:

\texttt{vortexcore: method \textless\textbf{algorithm}\textgreater}

Purpose:

Specify the algorithm to use to compute the vortex core parts.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>algorithm</td>
<td>vorticity vortex cores computed when the vorticity and velocity vectors are coincident</td>
</tr>
<tr>
<td></td>
<td></td>
<td>eigen_analysis vortex cores computed when the appropriate eigen-analysis indicates the element is intersected by swirling flow (default)</td>
</tr>
</tbody>
</table>

Example Usage:

\begin{verbatim}
part: select_begin
5
part: select_end
part: modify_begin
vortexcore: method vorticity
part: modify_end
\end{verbatim}

See Also:

Associated \texttt{vortexcore} commands
vortexcore: momentum

Command:

vortexcore: momentum <variable_name>

Purpose:

Specify the momentum variable to use in creating/updating a vortex core part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the momentum variable (the default name &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is assigned automatically if the variable name <Momentum> exists.

Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

variables: activate Momentum
vortexcore: select_default
part: modify_begin
vortexcore: momentum Momentum
part: modify_end

See Also:

Associated vortexcore commands
vortexcore: ratio_of_spec_heat

Command:

vortexcore: ratio_of_spec_heat <name or value>

Purpose:

Specify the ratio of specific heat constant value or variable name to use in creating/updating a vortex core part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>name</td>
<td>scalar field variable name for the ratio of specific heats</td>
</tr>
<tr>
<td>float</td>
<td>value</td>
<td>constant value (default = 1.4) for the ratio of specific heats</td>
</tr>
</tbody>
</table>

Example Usage:

vortexcore: select_default
part: modify_begin
vortexcore: ratio_of_spec_heat 1.4
part: modify_end

See Also:

Associated vortexcore commands
vortexcore: select_default

Command:

vortexcore: select_default

Purpose:

Specify that the default attributes of the vortex core part are to be set for all subsequent vortex core creates and updates.

Parameters:

None.

Example Usage:

vortexcore: select_default
part: modify_begin
vortexcore: momentum none
part: modify_end

See Also:

Associated vortexcore commands
Command:

vortexcore: threshold <variable_name>

Purpose:

Specify the threshold variable description by which to filter the segments of the selected vortex cores part.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the scalar variable by which to filter the vortex core segments</td>
</tr>
</tbody>
</table>

Notes:

The default threshold variable for vortex cores is "fx_vortcore_streng".

Example Usage:

```
part: select_begin
  5
part: select_end
part: modify_begin
vortexcore: threshold Density
part: modify_end
```

See Also:

Associated `vortexcore` commands
vortexcore: threshold_filter

Command:

`vortexcore: threshold_filter <option>`

Purpose:

Specify how to filter out segments of the specified vortex cores part, according to the specified threshold variable and value.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>constant</td>
<td>option</td>
<td>(default) filter out all values of the specified threshold variable less than the specified threshold value</td>
</tr>
<tr>
<td></td>
<td></td>
<td>filter out all values of the specified threshold variable greater than the specified threshold value</td>
</tr>
</tbody>
</table>

Example Usage:

```
part: select_begin
  5
part: select_end
part: modify_begin
vortexcore: threshold_filter >
part: modify_end
```

See Also:

Associated vortexcore commands
Command:

vortexcore: threshold_max <threshold_value>

Purpose:

Specify the maximum threshold limit under which to filter the threshold value of the selected vortex cores part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>maximum threshold variable range limit below which to threshold the vortex cores part</td>
</tr>
</tbody>
</table>

Notes:

This value must be greater than the threshold_min value, and be a valid threshold variable value. This value is initially automatically adjusted usually to an order of magnitude above the threshold value.

Example Usage:

```plaintext
part: select_begin
  5
part: select_end
part: modify_begin
vortexcore: threshold_max 1.0000e+01
part: modify_end
```

See Also:

Associated vortexcore commands
vortexcore: threshold_min

Command:

vortexcore: threshold_min <threshold_value>

Purpose:

Specify the minimum threshold limit above which to filter the threshold value of the selected vortex cores part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>minimum threshold variable range limit above which to threshold the vortex cores part</td>
</tr>
</tbody>
</table>

Notes:

This value must be less than the \textit{threshold\_max} value, and be a valid threshold variable value. This value is initially adjusted to the threshold value.

Example Usage:

```
part: select_begin
  5
part: select_end
part: modify_begin
vortexcore: threshold_min 1.0000e-01
part: modify_end
```

See Also:

Associated vortexcore commands
Command:

    vortexcore: threshold_value <threshold_value>

Purpose:

Specify the threshold value by which to filter the segments from the selected vortex cores part(s).

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>float</td>
<td>threshold_value</td>
<td>variable value by which to apply the threshold filter to the vortex core segments</td>
</tr>
</tbody>
</table>

Notes:

This value is automatically set to the minimum vortex core strength variable value of the vortex cores part. This value must lie within the threshold variable interval \([\text{threshold_min, threshold_max}]\).

Example Usage:

```
part: select_begin
    5
part: select_end
part: modify_begin
vortexcore: threshold_value 5.0000e-01
part: modify_end
```

See Also:

Associated vortexcore commands
vortexcore: velocity

Command:

```
vortexcore: velocity <variable_name>
```

Purpose:

Specify the velocity variable to use in creating/updating a vortex core part or the default attributes.

Parameters:

<table>
<thead>
<tr>
<th>Type</th>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>string</td>
<td>variable_name</td>
<td>name of the velocity variable (the default &lt;none&gt; means to use nothing)</td>
</tr>
</tbody>
</table>

Notes:

This variable is automatically assigned if the variable name `<velocity>` exists.

Since the computation of separation and attachment lines depend on velocity, either the velocity variable must be defined or both the density and momentum variables must be defined to obtain the velocity variable.

Example Usage:

```
variables: activate Velocity
vortexcore: select_default
part: modify_begin
vortexcore: velocity Velocity
part: modify_end
```

See Also:

Associated vortexcore commands
A
anim_flipbook ........................................... 21
begin_simtime ........................................ 22
begin_time_step ...................................... 23
cycle .................................................... 24
delete_all_pages ..................................... 25
display_speed ......................................... 26
dynamic_line ......................................... 27
dynamic_plane ........................................ 29
dynamic_value ........................................ 31
dsi lifelong ............................................ 33
dsi_read ............................................... 34
dsi_write .............................................. 35
dsi_write .............................................. 35
dtime .................................................... 36
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
dto ........................................................ 37
Index
anim_keyframe ........................................... 59
timeline_new ............................................ 77
timeline_select ......................................... 79
timeline_specify_incr ................................ 81
timeline_start/end_keyframe ..................... 85
timeline_start/end_step .............................. 88
timeline_start/end_time .............................. 90
timeline_start/end_type .............................. 92
timeline_step_increment ......................... 94
use_interactive_parts .............................. 98
use_spline ............................................ 99
use_transient_data .................................. 100
anim_quick .............................................. 101
accelerate_first/last .............................. 102
create_keyframes ................................. 103
explode_direction ................................. 104
explode_distance ................................. 105
explode_origin ...................................... 106
explode_view ........................................ 107
fly_around .......................................... 108
fly_direction ......................................... 109
fly revolves ......................................... 110
rotate_direction .................................... 111
rotate_objects ....................................... 112
rotate_revolutions ............................... 113
total_frames ........................................ 114
anim_recorders ....................................... 115
file_prefix filename .............................. 116
record .................................................. 117
render_offscreen ................................... 118
anim_screens ......................................... 119
save_multiple_images ............................ 120
type ...................................................... 121
x/y_max/min ......................................... 122
anim_traces ........................................... 123
color_by ............................................... 124
delta_time ............................................ 125
head_detail .......................................... 126
head_scale ........................................... 127
head_size_by ....................................... 128
head_type ............................................ 129
head_variable ....................................... 130
line_width .......................................... 131
max_time ............................................. 132
multiple_pulses ..................................... 133
particle_time ....................................... 134
pulse_interval ....................................... 135
RGB ...................................................... 136
set_max_time ....................................... 137
start_time .......................................... 138
sync_to_transient ................................ 139
annot_entlbl ......................................... 141
Index

<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>element_rgb</td>
<td>142</td>
</tr>
<tr>
<td>element_threshold_high/low</td>
<td>143</td>
</tr>
<tr>
<td>element_thresholds</td>
<td>144</td>
</tr>
<tr>
<td>node_rgb</td>
<td>145</td>
</tr>
<tr>
<td>node_threshold_high/low</td>
<td>146</td>
</tr>
<tr>
<td>node_thresholds</td>
<td>147</td>
</tr>
<tr>
<td>annotation</td>
<td>149</td>
</tr>
<tr>
<td>axis_global</td>
<td>150</td>
</tr>
<tr>
<td>axis_local</td>
<td>151</td>
</tr>
<tr>
<td>axis_model</td>
<td>152</td>
</tr>
<tr>
<td>deselect_all</td>
<td>153</td>
</tr>
<tr>
<td>element_labeling</td>
<td>154</td>
</tr>
<tr>
<td>legend</td>
<td>155</td>
</tr>
<tr>
<td>node_labeling</td>
<td>156</td>
</tr>
<tr>
<td>text_display</td>
<td>157</td>
</tr>
<tr>
<td>boundarylayer</td>
<td>159</td>
</tr>
<tr>
<td>create_update</td>
<td>160</td>
</tr>
<tr>
<td>density</td>
<td>161</td>
</tr>
<tr>
<td>determine_velocity_by</td>
<td>162</td>
</tr>
<tr>
<td>dynamic_viscosity</td>
<td>163</td>
</tr>
<tr>
<td>freestream_density</td>
<td>164</td>
</tr>
<tr>
<td>freestream_velocity</td>
<td>165</td>
</tr>
<tr>
<td>modify_begin/end</td>
<td>166</td>
</tr>
<tr>
<td>momentum</td>
<td>167</td>
</tr>
<tr>
<td>normal_distance</td>
<td>168</td>
</tr>
<tr>
<td>velocity</td>
<td>169</td>
</tr>
<tr>
<td>velocity_magnitude</td>
<td>170</td>
</tr>
<tr>
<td>command</td>
<td>171</td>
</tr>
<tr>
<td>case</td>
<td>172</td>
</tr>
<tr>
<td>apply_context</td>
<td>173</td>
</tr>
<tr>
<td>create_viewport</td>
<td>174</td>
</tr>
<tr>
<td>delete</td>
<td>175</td>
</tr>
<tr>
<td>reflect_model_in</td>
<td>176</td>
</tr>
<tr>
<td>reflect_model_origin</td>
<td>177</td>
</tr>
<tr>
<td>replace</td>
<td>178</td>
</tr>
<tr>
<td>select</td>
<td>179</td>
</tr>
<tr>
<td>viewports</td>
<td>180</td>
</tr>
<tr>
<td>connect</td>
<td>181</td>
</tr>
<tr>
<td>angle</td>
<td>182</td>
</tr>
<tr>
<td>axis</td>
<td>183</td>
</tr>
<tr>
<td>begin/end</td>
<td>184</td>
</tr>
<tr>
<td>box_axis</td>
<td>185</td>
</tr>
<tr>
<td>box_length</td>
<td>186</td>
</tr>
<tr>
<td>box_min/max</td>
<td>187</td>
</tr>
<tr>
<td>box_origin</td>
<td>188</td>
</tr>
<tr>
<td>create</td>
<td>189</td>
</tr>
<tr>
<td>delta</td>
<td>190</td>
</tr>
<tr>
<td>dimension2/dimension3</td>
<td>191</td>
</tr>
<tr>
<td>dimension2/dimension3_step</td>
<td>192</td>
</tr>
<tr>
<td>domain</td>
<td>193</td>
</tr>
<tr>
<td>general_equation</td>
<td>194</td>
</tr>
<tr>
<td>grid_pts</td>
<td>195</td>
</tr>
<tr>
<td>ijk_axis</td>
<td>196</td>
</tr>
<tr>
<td>ijk_axis_scale</td>
<td>197</td>
</tr>
<tr>
<td>interactive_type</td>
<td>198</td>
</tr>
<tr>
<td>line</td>
<td>199</td>
</tr>
<tr>
<td>mesh_plane</td>
<td>200</td>
</tr>
<tr>
<td>origin</td>
<td>201</td>
</tr>
<tr>
<td>plane</td>
<td>202</td>
</tr>
<tr>
<td>plane_extents</td>
<td>203</td>
</tr>
<tr>
<td>plane_type</td>
<td>204</td>
</tr>
<tr>
<td>point</td>
<td>205</td>
</tr>
<tr>
<td>pts_on_line</td>
<td>206</td>
</tr>
<tr>
<td>radius</td>
<td>207</td>
</tr>
<tr>
<td>revolution_points</td>
<td>208</td>
</tr>
<tr>
<td>revolve_part</td>
<td>209</td>
</tr>
<tr>
<td>revolve_partbyname</td>
<td>210</td>
</tr>
<tr>
<td>rtz_axis</td>
<td>211</td>
</tr>
<tr>
<td>select_default</td>
<td>212</td>
</tr>
<tr>
<td>slider_range_ijk</td>
<td>213</td>
</tr>
<tr>
<td>slider_step</td>
<td>214</td>
</tr>
<tr>
<td>slider_step_ijk</td>
<td>215</td>
</tr>
<tr>
<td>slider_x/y/z</td>
<td>216</td>
</tr>
<tr>
<td>tool</td>
<td>217</td>
</tr>
<tr>
<td>value</td>
<td>218</td>
</tr>
<tr>
<td>x/y/z_min/max_infinite</td>
<td>219</td>
</tr>
<tr>
<td>command</td>
<td>220</td>
</tr>
<tr>
<td>delay</td>
<td>221</td>
</tr>
<tr>
<td>delay_refresh</td>
<td>222</td>
</tr>
<tr>
<td>part_selection_by</td>
<td>223</td>
</tr>
<tr>
<td>connect</td>
<td>224</td>
</tr>
<tr>
<td>backend</td>
<td>225</td>
</tr>
<tr>
<td>connect</td>
<td>226</td>
</tr>
<tr>
<td>default</td>
<td>227</td>
</tr>
<tr>
<td>directory.pathname</td>
<td>228</td>
</tr>
<tr>
<td>executable.filename</td>
<td>229</td>
</tr>
<tr>
<td>login_id.username</td>
<td>230</td>
</tr>
<tr>
<td>machine.hostname</td>
<td>231</td>
</tr>
<tr>
<td>type.value</td>
<td>232</td>
</tr>
<tr>
<td>contour</td>
<td>233</td>
</tr>
<tr>
<td>begin/end</td>
<td>234</td>
</tr>
<tr>
<td>component</td>
<td>235</td>
</tr>
<tr>
<td>create</td>
<td>236</td>
</tr>
<tr>
<td>create</td>
<td>237</td>
</tr>
<tr>
<td>display_offset</td>
<td>238</td>
</tr>
<tr>
<td>distribution</td>
<td>239</td>
</tr>
<tr>
<td>label_decimal_places</td>
<td>240</td>
</tr>
<tr>
<td>label_format</td>
<td>241</td>
</tr>
<tr>
<td>label_rgb</td>
<td>242</td>
</tr>
<tr>
<td>label_spacing</td>
<td>243</td>
</tr>
<tr>
<td>label_visible</td>
<td>244</td>
</tr>
<tr>
<td>levels</td>
<td>245</td>
</tr>
<tr>
<td>levels_visible</td>
<td>246</td>
</tr>
<tr>
<td>text_display</td>
<td>247</td>
</tr>
</tbody>
</table>

Table of Contents EnSight7 Command Language Manual
Index

image_postscript_subd .................................. 353
image_postscript_type .................................. 354
image_printer_command .................................. 355
image_printer_model .................................... 356
image_quality ........................................... 357
image_saturation ........................................ 358
image_scale_factor ...................................... 359
image_to_file ............................................ 360
image_to_printer ........................................ 361
image_window_size ....................................... 362
image_window_xy .......................................... 363
restore_context ......................................... 364
restore_full_backup ..................................... 365
save_context ............................................. 366
save_context_type ....................................... 367
save_full_backup ........................................ 368
save_image .............................................. 369
save_multile_images ..................................... 370
save_scenario_file ...................................... 371
save_scenario_project .................................. 372
save_scenario_view ...................................... 373
scenario_desc_begin/end ................................ 374
scenario_flipbook_anim .................................. 375
scenario_keyframe_anim .................................. 376
scenario_trace_anim ..................................... 377
format ...................................................... 379
replace_index ............................................ 380
frame ...................................................... 381
#_of_labels_x/y/z ....................................... 382
assign ..................................................... 383
create ..................................................... 384
delete ..................................................... 385
len_x/y/z .................................................. 386
line_width ................................................ 387
modify_begin/end ....................................... 388
orientation_x/y/z ....................................... 389
origin ...................................................... 390
gb ......................................................... 391
select_all ............................................... 392
select_begin/end ........................................ 393
select_default .......................................... 394
symmetry_angle ......................................... 395
symmetry_axis .......................................... 396
symmetry_delta ......................................... 397
symmetry_file ......................................... 398
symmetry_mirror_x/y/z/xyz ................................ 399
symmetry_rinstances .................................... 400
symmetry_tinstances .................................... 401
symmetry_type .......................................... 402
symmetry_use_file ...................................... 403
type ....................................................... 404
visible .................................................... 405
x/y/z_labels ............................................. 406
function ................................................... 407
#_of_colors ............................................. 408
#_of_levels ............................................. 409
display_undefined ....................................... 410edit_level .............................................. 411
limit_fringes ............................................ 412
modify_begin/end ....................................... 413
over_time ............................................... 414
palette ................................................... 415
restore .................................................... 416
restore_predefinedpal ................................... 417
RGB ....................................................... 418
save ....................................................... 419
save_all .................................................. 420
save_current_case ..................................... 421
scale ...................................................... 422
select_default .......................................... 423
type ....................................................... 424
value ...................................................... 425
I
interrupt .................................................. 20
Introduction ............................................... 5
isos ......................................................... 427
begin/end .................................................. 22
component ................................................ 22
constraint ................................................. 22
create ..................................................... 23
interactive_auto_delta ................................ 23
interactive_rangemin/rangemax ....................... 23
interactive_type ....................................... 23
min/max ................................................... 23
select_default .......................................... 23
type ....................................................... 23
value ...................................................... 23
variable .................................................. 23
L
legend ........................................................ 441
format ...................................................... 442
height ...................................................... 443
location_x/y ............................................. 444
orientation .............................................. 445
select_all .............................................. 446
select_default .......................................... 447
select_palette_begin/end ................................ 448
text_position ............................................ 449
text_rgb ................................................... 450
text_size .................................................. 451
title ....................................................... 452
type ....................................................... 453
visible .................................................... 454
width ....................................................... 455
<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>line</td>
<td>457</td>
</tr>
<tr>
<td>arrowhead</td>
<td>458</td>
</tr>
<tr>
<td>delete</td>
<td>459</td>
</tr>
<tr>
<td>location_x/y</td>
<td>460</td>
</tr>
<tr>
<td>modify_begin/end</td>
<td>461</td>
</tr>
<tr>
<td>new_line</td>
<td>462</td>
</tr>
<tr>
<td>rgb</td>
<td>463</td>
</tr>
<tr>
<td>select_all</td>
<td>464</td>
</tr>
<tr>
<td>select_begin/end</td>
<td>465</td>
</tr>
<tr>
<td>select_default</td>
<td>466</td>
</tr>
<tr>
<td>visible</td>
<td>467</td>
</tr>
<tr>
<td>width</td>
<td>468</td>
</tr>
<tr>
<td>logo</td>
<td>469</td>
</tr>
<tr>
<td>delete</td>
<td>470</td>
</tr>
<tr>
<td>location_x/y</td>
<td>471</td>
</tr>
<tr>
<td>modify_begin/end</td>
<td>472</td>
</tr>
<tr>
<td>new_logo</td>
<td>473</td>
</tr>
<tr>
<td>scale</td>
<td>474</td>
</tr>
<tr>
<td>select_all</td>
<td>475</td>
</tr>
<tr>
<td>select_begin/end</td>
<td>476</td>
</tr>
<tr>
<td>select_default</td>
<td>477</td>
</tr>
<tr>
<td>visible</td>
<td>478</td>
</tr>
<tr>
<td>material</td>
<td>479</td>
</tr>
<tr>
<td>begin/end</td>
<td>480</td>
</tr>
<tr>
<td>create</td>
<td>481</td>
</tr>
<tr>
<td>select_bynamespace_begin/end</td>
<td>482</td>
</tr>
<tr>
<td>select_default</td>
<td>483</td>
</tr>
<tr>
<td>subdivide</td>
<td>484</td>
</tr>
<tr>
<td>type</td>
<td>485</td>
</tr>
<tr>
<td>message-window</td>
<td>487</td>
</tr>
<tr>
<td>clear</td>
<td>488</td>
</tr>
<tr>
<td>save</td>
<td>489</td>
</tr>
<tr>
<td>model</td>
<td>491</td>
</tr>
<tr>
<td>ijk_axis_visibility</td>
<td>492</td>
</tr>
<tr>
<td>ijk_axis_scale</td>
<td>493</td>
</tr>
<tr>
<td>noderangestep_i/j/k</td>
<td>494</td>
</tr>
<tr>
<td>select_default</td>
<td>495</td>
</tr>
<tr>
<td>part</td>
<td>500</td>
</tr>
<tr>
<td>active</td>
<td>501</td>
</tr>
<tr>
<td>allow_default_editing</td>
<td>502</td>
</tr>
<tr>
<td>bounding_rep</td>
<td>503</td>
</tr>
<tr>
<td>clip</td>
<td>504</td>
</tr>
<tr>
<td>colorby_palette</td>
<td>505</td>
</tr>
<tr>
<td>colorby_rgb</td>
<td>506</td>
</tr>
<tr>
<td>colorby_selected_var</td>
<td>507</td>
</tr>
<tr>
<td>copy</td>
<td>508</td>
</tr>
<tr>
<td>create_assignViewport</td>
<td>509</td>
</tr>
<tr>
<td>delete</td>
<td>510</td>
</tr>
<tr>
<td>description</td>
<td>511</td>
</tr>
<tr>
<td>displace_by</td>
<td>513</td>
</tr>
<tr>
<td>displace_factor</td>
<td>512</td>
</tr>
<tr>
<td>elt_representation</td>
<td>514</td>
</tr>
<tr>
<td>elt_feature_angle</td>
<td>515</td>
</tr>
<tr>
<td>elt_shrink_factor</td>
<td>516</td>
</tr>
<tr>
<td>entity_label_elt</td>
<td>517</td>
</tr>
<tr>
<td>entity_label_node</td>
<td>518</td>
</tr>
<tr>
<td>extract</td>
<td>519</td>
</tr>
<tr>
<td>fill_pattern</td>
<td>520</td>
</tr>
<tr>
<td>get_mainpartlist_select</td>
<td>521</td>
</tr>
<tr>
<td>group</td>
<td>522</td>
</tr>
<tr>
<td>hidden_line</td>
<td>523</td>
</tr>
<tr>
<td>hidden_surface</td>
<td>524</td>
</tr>
<tr>
<td>light_diff</td>
<td>525</td>
</tr>
<tr>
<td>light_h_int</td>
<td>526</td>
</tr>
<tr>
<td>light_shin</td>
<td>527</td>
</tr>
<tr>
<td>line_style</td>
<td>528</td>
</tr>
<tr>
<td>line_width</td>
<td>529</td>
</tr>
<tr>
<td>merge</td>
<td>530</td>
</tr>
<tr>
<td>mirror_original</td>
<td>531</td>
</tr>
<tr>
<td>mirror_x/y/z/xyz/xyz</td>
<td>532</td>
</tr>
<tr>
<td>modify_begin/end</td>
<td>533</td>
</tr>
<tr>
<td>node_detail</td>
<td>534</td>
</tr>
<tr>
<td>node_scale</td>
<td>535</td>
</tr>
<tr>
<td>node_sizeby</td>
<td>536</td>
</tr>
<tr>
<td>node_type</td>
<td>537</td>
</tr>
<tr>
<td>node_variable</td>
<td>538</td>
</tr>
<tr>
<td>opaqueness</td>
<td>539</td>
</tr>
<tr>
<td>reduce_polygons</td>
<td>540</td>
</tr>
<tr>
<td>reduce_polygons_factor</td>
<td>541</td>
</tr>
<tr>
<td>ref_frame</td>
<td>542</td>
</tr>
<tr>
<td>select_all</td>
<td>543</td>
</tr>
<tr>
<td>select_all_case</td>
<td>544</td>
</tr>
<tr>
<td>select_all_default</td>
<td>545</td>
</tr>
<tr>
<td>select_begin/end</td>
<td>546</td>
</tr>
<tr>
<td>select_default</td>
<td>547</td>
</tr>
<tr>
<td>select_lastcreatedpart</td>
<td>548</td>
</tr>
<tr>
<td>select_lastonecreated</td>
<td>549</td>
</tr>
<tr>
<td>select_mainpartlist_all</td>
<td>550</td>
</tr>
<tr>
<td>select_partexpr_begin/end</td>
<td>551</td>
</tr>
<tr>
<td>select_partname_begin/end</td>
<td>552</td>
</tr>
<tr>
<td>shading</td>
<td>553</td>
</tr>
<tr>
<td>symmetry_angle</td>
<td>554</td>
</tr>
<tr>
<td>symmetry_axis</td>
<td>555</td>
</tr>
<tr>
<td>symmetry_mirror_x/y/z/xyz/xyz</td>
<td>556</td>
</tr>
<tr>
<td>symmetry_rinstances</td>
<td>557</td>
</tr>
<tr>
<td>symmetry_type</td>
<td>558</td>
</tr>
<tr>
<td>ungroup</td>
<td>559</td>
</tr>
<tr>
<td>updparts</td>
<td>560</td>
</tr>
<tr>
<td>viewport_visibility</td>
<td>561</td>
</tr>
<tr>
<td>visibility_elt</td>
<td>562</td>
</tr>
<tr>
<td>visibility_line</td>
<td>563</td>
</tr>
</tbody>
</table>
Index

visible ........................................ 565

plot

filename ........................................ 20

auto_scale .................................... 569
axis_linewidth ................................. 570
axis_rgb ....................................... 571
axis_swap_minmax .............................. 572
axis_x/y_gridtype ............................. 573
axis_x/y_labelformat ........................... 574
axis_x/y_labelsize ............................. 576
axis_x/y_labelrgb .............................. 575
axis_x/y_labelsize ............................. 579
axis_x/y_labeltype ............................. 577
axis_x/y_max ................................... 578
axis_x/y_min ................................... 579
axis_x/y_numgrid ............................... 580
axis_x/y_numsubgrid ........................... 581
axis_x/y_origin ................................. 582
axis_x/y_scale ................................. 583
axis_x/y_sgridtype ............................. 584
axis_x/y_title ................................ 585
axis_x/y_titlergb .............................. 586
axis_x/y_titlesize .............................. 587
axis_x/y_visible ............................... 588
background_rgb ............................... 589
background_type ............................... 590
border_rgb ..................................... 591
border_visible ................................ 592
delete_plot .................................... 593
grid_linetype .................................. 594
grid_linewidth ................................. 595
grid_rgb ....................................... 596
height .......................................... 597
legend_rgb ..................................... 598
legend_textsize ................................ 599
legend_visible ................................ 600
origin_x/y ...................................... 601
plot_title ...................................... 602
select_all ..................................... 603
select_begin/end .............................. 604
select_default ................................. 605
subgrid_linetype .............................. 606
subgrid_linewidth ............................. 607
subgrid_rgb .................................... 608
title_rgb ....................................... 609
title_textsize ................................ 610
visible ........................................... 611
width ............................................ 612

prefs ............................................. 613
auto_legend_display ........................... 614
auto_legend_replace ........................... 615

auto_load_parts ............................... 616
cull_lines ..................................... 617
default_data_directory ....................... 618
default_palette ................................ 619
fastdisplay_point_res ....................... 620
fastdisplay_sparse_res ....................... 621
frame_mode_allowed ......................... 622
function_editor_type ......................... 623
icon_help_labels ............................... 624
large_parts_list .............................. 625
legend_colorby ................................. 626
macro_panel .................................... 627
new_data_notification ....................... 628
part_panel ...................................... 629
resetlegend_ontimechange ................... 630
starting_time_step ........................... 631
static_fast_display .......................... 632
toolTips ........................................ 633
transparency_resort ......................... 634
use_continuous_perelem ...................... 635
user_defined_input ............................ 636
user_input_rotatesens ....................... 637
user_input_rotateusing ...................... 638
user_input_zoomsens .......................... 639
user_input_zoomusing ......................... 640
view_mode_allowed ............................ 641

profile ........................................ 642
begin/end ...................................... 644
component ...................................... 645
create .......................................... 646
in_plane ....................................... 647
offset .......................................... 648
scale_factor ................................... 649
select_default ................................ 650
variable ....................................... 651

ptrace ......................................... 652
add_file ....................................... 655
add_net ........................................ 656
add_part ....................................... 658
add_partbyname ................................ 659
add_pt .......................................... 660
add_rake ....................................... 662
add_surface_net ............................... 664
add_surface_pt ................................ 666
add_surface_rake ............................. 668
animate ........................................ 670
begin .......................................... 671
component ...................................... 672
create_file .................................... 673
create_net ..................................... 674
create_part .................................... 675
create_partbyname ......................... 676
create_pt ....................... 677
create_rake .................. 678
create_surface_net .......... 679
create_surface_pt .......... 680
create_surface_rake ....... 681
default_emit_file .......... 682
default_emit_net .......... 683
default_emit_part .......... 684
default_emit_partbyname ... 685
default_emit_pt .......... 686
default_emit_rake .......... 687
delete_emitter ............. 688
delta_time ................. 689
display_offset ............ 690
emit_at_current_time ...... 691
emit_density .............. 692
emit_number ................ 693
massed_drag ............... 694
massed_drag_coefficient ... 695
massed_fluid_density ...... 697
massed_fluid_viscosity ... 698
massed_gravity_vector ... 700
massed_initial_use_fluid .. 701
massed_initial_velocity ... 702
massed_particle_density ... 704
massed_particle_diameter ... 705
massed_particles .......... 703
massed_pressure .......... 706
massed_pressure_gradient ... 707
max_angle .................. 708
min_angle .................. 709
min_steps .................. 710
modify_emit_toooloc ........ 711
modify_fileemit_name ...... 712
modify_netemit_points ...... 713
modify_partemit_bname ...... 714
modify_partemit_num ...... 715
modify_rakeemit_points ... 716
representation ............. 717
ribbon_width .............. 718
rot_angle .................. 719
select_default ........... 720
select_emitter_begin/end . 721
start_time ................ 722
surface_restricted ....... 723
total_time ............... 724
trace_direction .......... 725
type .................... 726
variable .................. 727
variable_offset .......... 728
Q
query_ent_var ............... 729

#_of_sample_pts ............ 730
auto_plot_checkexisting .... 732
auto_plot_queries ........... 733
begin/end .................. 734
begin_simtime ............. 735
constraint ................ 736
cursor_loc ................ 738
description .............. 739
distance ................. 740
elem_id .................... 741
end_simtime .............. 742
generate_over ............. 743
ijk ......................... 744
line_loc ................... 745
marker_rgb ............... 746
marker_size_normalized ... 747
marker_visible ........... 748
modify_begin/end .......... 749
multiple_segments_by ...... 750
node_id .................... 751
operation_factor1/_factor2. 752
operation_query1byname/_query2byname753
origin ..................... 754
part_id ................... 755
part_idbyname ............. 756
query ....................... 757
query_type ................ 758
sample_by .................. 759
select_all_timesteps ...... 761
type ...................... 762
variable_1/variable_2. ... 763
query_interact ........... 765
#_displayed ................ 766
create ..................... 767
display_id ................ 769
label_always_on_top ...... 770
label_rgb ................ 771
marker_size_normalized ... 772
marker_visible ........... 773
query ....................... 774
request_method ........... 776
save ....................... 777
search ..................... 778
select_default ........... 779
select_varname_begin/end . 780
S
savegeom ................... 781
begin/end_step ........... 782
binary .................... 784
brick_format ............. 782
format .................... 785
maximum_file_size ....... 786
Index

parameters .................................................. 787
resolution .................................................... 788
save_geometric_entities ................................. 789
select_all_steps .......................................... 790
single_file .................................................. 791
step_by ....................................................... 792
undefined .................................................... 793
variable ...................................................... 794
sepattach
begin/end ....................................................... 796
create ........................................................ 797
density ......................................................... 798
display_offset .............................................. 799
method ......................................................... 800
momentum ..................................................... 801
ratio_of_spec_heat ........................................ 802
select_default .............................................. 803
threshold ..................................................... 804
threshold_filter ........................................... 805
threshold_max/min ......................................... 806
threshold_value ............................................ 807
velocity ....................................................... 808
shell ............................................................. 809, 810
shock
begin/end ....................................................... 811
create ........................................................ 812
density ......................................................... 815
tenhalpy ....................................................... 816
gas_constant ................................................ 817
mach ............................................................ 818
method ......................................................... 819
momentum ..................................................... 820
pressure ....................................................... 821
ratio_of_spec_heat ........................................ 822
select_default .............................................. 823
temperature .................................................. 824
threshold ..................................................... 825
threshold_filter ........................................... 826
threshold_max/min ......................................... 827
threshold_value ............................................ 828
total_energy .................................................. 829
variable ....................................................... 830
velocity ....................................................... 832
show_info
cursor .......................................................... 833
element ........................................................ 834
ijk ............................................................... 835
node ............................................................ 836
part ............................................................. 839
solution_time
#_of_cycles .................................................. 841
begin/end_simtime ......................................... 843
begin/end_step .............................................. 844
current_simtime ............................................ 845
current_step ............................................... 846
increment .................................................... 847
show_as ....................................................... 848
timeset_between ............................................ 849
timeset_leftof .............................................. 850
timeset_rightof ............................................ 851
timeset_select .............................................. 852
timeset_update ............................................. 853
update_to_current ......................................... 854
update_to_first ............................................ 855
update_to_last ............................................. 856
update_type ................................................ 857
zoomout ..................................................... 858
subset ........................................................ 859
begin/end ....................................................... 860
begin/end_subsetdesc ..................................... 861
create ........................................................ 862
select_default .............................................. 863
T
tensor .......................................................... 865
begin/end ....................................................... 866
color_by ....................................................... 867
compression_line_width .................................. 869
compression_rgb ........................................... 870
create ........................................................ 871
display_compression ....................................... 872
display_major/middle/minor ................................ 874
display_tension ............................................. 876
line_width_by .............................................. 878
scale_factor ................................................ 880
select_default .............................................. 882
tension_line_width ....................................... 883
tension_rgb ................................................ 884
tip_shape ..................................................... 885
tip_size ....................................................... 886
variable ....................................................... 887
text ............................................................. 889
change_text .................................................. 890
delete ........................................................ 891
justification ................................................ 892
location_x/y ................................................ 893
modify_begin/end ......................................... 894
new_text ..................................................... 895
relative_viewport ........................................ 896
rgb ............................................................. 897
rotational_angle .......................................... 898
select_all .................................................... 899
select_begin/end .......................................... 900
select_default .............................................. 901
size ........................................................... 902
<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>translate</td>
<td>1011</td>
</tr>
<tr>
<td>undo</td>
<td>1013</td>
</tr>
<tr>
<td>view_recall</td>
<td>1014</td>
</tr>
<tr>
<td>view_store</td>
<td>1015</td>
</tr>
<tr>
<td>viewport_link</td>
<td>1016</td>
</tr>
<tr>
<td>viewport_state_copy</td>
<td>1017</td>
</tr>
<tr>
<td>zclip_back/front</td>
<td>1018</td>
</tr>
<tr>
<td>zclip_float</td>
<td>1019</td>
</tr>
<tr>
<td>zclip_min</td>
<td>1020</td>
</tr>
<tr>
<td>zoom</td>
<td>1021</td>
</tr>
<tr>
<td>zoom_style</td>
<td>1022</td>
</tr>
<tr>
<td>viewport</td>
<td>1023</td>
</tr>
<tr>
<td>background_type</td>
<td>1024</td>
</tr>
<tr>
<td>blend_editlevel</td>
<td>1025</td>
</tr>
<tr>
<td>blend_levels</td>
<td>1026</td>
</tr>
<tr>
<td>blend_position</td>
<td>1027</td>
</tr>
<tr>
<td>blend_rgb</td>
<td>1028</td>
</tr>
<tr>
<td>border_rgb</td>
<td>1029</td>
</tr>
<tr>
<td>border_visible</td>
<td>1030</td>
</tr>
<tr>
<td>constant_rgb</td>
<td>1031</td>
</tr>
<tr>
<td>delete</td>
<td>1032</td>
</tr>
<tr>
<td>height</td>
<td>1033</td>
</tr>
<tr>
<td>hidden_line</td>
<td>1034</td>
</tr>
<tr>
<td>hidden_surface</td>
<td>1035</td>
</tr>
<tr>
<td>lower</td>
<td>1036</td>
</tr>
<tr>
<td>new</td>
<td>1037</td>
</tr>
<tr>
<td>origin_x/y</td>
<td>1038</td>
</tr>
<tr>
<td>perspective</td>
<td>1039</td>
</tr>
<tr>
<td>raise</td>
<td>1040</td>
</tr>
<tr>
<td>select_all</td>
<td>1041</td>
</tr>
<tr>
<td>select_begin/end</td>
<td>1042</td>
</tr>
<tr>
<td>select_default</td>
<td>1043</td>
</tr>
<tr>
<td>viewport_dimension</td>
<td>1044</td>
</tr>
<tr>
<td>viewport_layout</td>
<td>1045</td>
</tr>
<tr>
<td>visible</td>
<td>1046</td>
</tr>
<tr>
<td>width</td>
<td>1047</td>
</tr>
<tr>
<td>viewport_bounds</td>
<td>1049</td>
</tr>
<tr>
<td>auto_size</td>
<td>1051</td>
</tr>
<tr>
<td>axis_linewidth</td>
<td>1052</td>
</tr>
<tr>
<td>axis_rgb</td>
<td>1053</td>
</tr>
<tr>
<td>axis_x/y/z_format</td>
<td>1054</td>
</tr>
<tr>
<td>axis_x/y/z_gridextentloc</td>
<td>1055</td>
</tr>
<tr>
<td>axis_x/y/z_gridtype</td>
<td>1056</td>
</tr>
<tr>
<td>axis_x/y/z_labelaxisloc</td>
<td>1057</td>
</tr>
<tr>
<td>axis_x/y/z_labelextentloc</td>
<td>1058</td>
</tr>
<tr>
<td>axis_x/y/z_labelrgb</td>
<td>1059</td>
</tr>
<tr>
<td>axis_x/y/z_min/max</td>
<td>1060</td>
</tr>
<tr>
<td>axis_x/y/z_numgrid</td>
<td>1061</td>
</tr>
<tr>
<td>axis_x/y/z_numsubgrid</td>
<td>1062</td>
</tr>
<tr>
<td>axis_x/y/z_sgridtype</td>
<td>1063</td>
</tr>
<tr>
<td>dimension</td>
<td>1064</td>
</tr>
<tr>
<td>grid_linewidth</td>
<td>1065</td>
</tr>
<tr>
<td>grid_rgb</td>
<td>1066</td>
</tr>
<tr>
<td>length</td>
<td>1067</td>
</tr>
<tr>
<td>subgrid_linetype</td>
<td>1068</td>
</tr>
<tr>
<td>subgrid_linewidth</td>
<td>1069</td>
</tr>
<tr>
<td>subgrid_rgb</td>
<td>1070</td>
</tr>
<tr>
<td>transparency</td>
<td>1071</td>
</tr>
<tr>
<td>visible</td>
<td>1072</td>
</tr>
<tr>
<td>vortexcore</td>
<td>1073</td>
</tr>
<tr>
<td>begin/end</td>
<td>1074</td>
</tr>
<tr>
<td>create</td>
<td>1075</td>
</tr>
<tr>
<td>density</td>
<td>1076</td>
</tr>
<tr>
<td>method</td>
<td>1077</td>
</tr>
<tr>
<td>momentum</td>
<td>1078</td>
</tr>
<tr>
<td>ratio_of_spec_heat</td>
<td>1079</td>
</tr>
<tr>
<td>select_default</td>
<td>1080</td>
</tr>
<tr>
<td>threshold</td>
<td>1081</td>
</tr>
<tr>
<td>threshold_filter</td>
<td>1082</td>
</tr>
<tr>
<td>threshold_max</td>
<td>1083</td>
</tr>
<tr>
<td>threshold_min</td>
<td>1084</td>
</tr>
<tr>
<td>threshold_max</td>
<td>1085</td>
</tr>
<tr>
<td>threshold_value</td>
<td>1086</td>
</tr>
<tr>
<td>velocity</td>
<td>1087</td>
</tr>
<tr>
<td>velocity</td>
<td>1088</td>
</tr>
</tbody>
</table>