cadence®

Stimulus Editor Help

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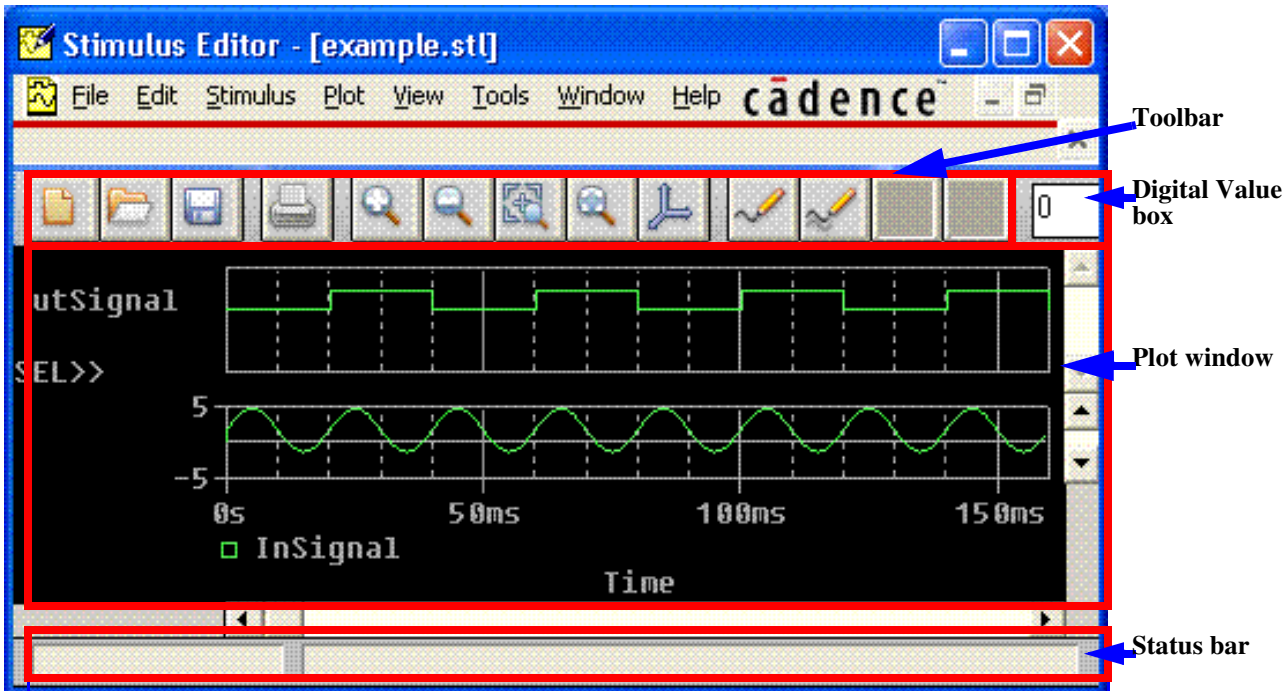
Contents

About Stimulus Editor

Stimulus Editor is used to create analog and digital input signals or stimuli for use in simulation.

The parts of the screen include the plot window, the toolbar, and the status bar.



The plot window shows a graphical representation of stimuli in the current library. Graphical editing of digital stimuli and PWLs takes place in this window.

Both digital and analog stimuli can be shown and edited simultaneously. Stimuli can be selected by clicking on their names along the axes.

The toolbar provides convenient access to commonly used functions.

The digital value box is used to specify the values of new digital transitions.

The status bar displays messages about the current operation. The left side of the status bar gives the coordinates of the current position of the pointer when the mouse is over a plot.

To learn more about Stimulator Editor, see the following topics:

- Using Stimuli: To learn how to create new stimuli
- Editing a Stimulus: To learn how to edit a stimulus

- Setting Stimulus Editor Options: To learn how to set preferences

Using files

Using stimulus files, you can open, close, save, and save a file as a new name.

To create a new plot window

Do one of the following:

- On the toolbar, click the New Document button.
- From the File menu, select New. Now you can define stimuli for a new stimulus library file.
- To plot stimuli from a currently open stimulus library in a new plot window, select New from the Window menu.

To open a file

1. Do one of the following:
   - On the toolbar, click the Open button.
   - From the File menu, select Open.
2. Select a file from the list.
3. Click OK.

A new plot window opens that has a link to the stimulus library.

Note: Only one stimulus library can be opened in a plot window.

To close a file

Choose File-Close. All plot windows that have a link associated with the library are also closed.

If you have unsaved changes, you are prompted to save them now.

To save a file

Do one of the following:

- On the toolbar, click the Save button
- From the File menu, select Save.

The changes to the current stimulus library are saved.

To save a file as

1. Choose File-Save As.
2. In the Save As dialog box, type the name for the file.
3. The data is saved to a file with the name you specify. If a file already exists with the specified name, you can overwrite it or select a new name.
4. Click OK.

Zooming and panning

You can change the way Stimulus Editor displays the traces on a plot. You can zoom in or out, change the center point, display only a selected area, see the previous view, and fit the display to the plot.

To zoom in or out

Do one of the following:

- On the toolbar, click Zoom In or Zoom Out
- From the View menu, select In or Out.

Zoom In zooms in by a factor of 2 around the point you specify.

Zoom Out zooms out by a factor of 2 around the point you specify.

To change the center point

1. From the View menu, select Pan New Center.
2. Click the new center.

3. The screen redraws with the new center, maintaining the previous scale.

To display the selected area

1. Do one of the following:
   - ❑ On the toolbar, click the Area button.
   - ❑ From the View menu, select Area.
2. Click the mouse in the plot window.
3. Drag a box around the area you want to view.

   The area is displayed.

To redraw the screen

1. Choose View-Redraw.

   The screen is immediately redrawn.

To see the previous view

1. Choose View -Previous.

   The screen is redrawn to the previous view, whether it was the last scroll position or the last screen setting.
2. Repeat to go back to more views.

To fit the view

Do one of the following:

- ❑ On the toolbar, click the Fit button
- ❑ From the View menu, select Fit.

The selected plot changes scale so that all data fit in the plot view on the screen.

Printing files

You can print a copy of any or all of the plot windows currently open.

To print a file

1. Do one of the following:
   - On the toolbar, click the Print button
   - From the File menu, select Print.
2. Select the open plot window you want to print.

   Note: To select all of the plot windows, click the Select All button.
3. Make any necessary changes.
4. Click OK.

Using Stimuli

Using the Stimulus Editor you can create new stimuli and label the stimuli. You can also plot the stimulus window.

Creating a new stimulus

Adds a new stimulus to the current plot window.

To create a new stimulus

1. Do one of the following:
   - On the toolbar, click the New Stimulus button
   - From the Stimulus menu, select New.

   The New Stimulus dialog box appears.
2. In the Name box, type a stimulus name.
3. Select a stimulus type. Select from the Analog or Digital columns.
4. If the stimulus is digital, type an initial digital value
5. Click OK.
6. One of the following occurs:
   - If you created an analog EXP, PULSE, SFFM, SIN, or a digital clock, complete the Attributes dialog box and click OK.
   - If you specified an analog PWL, or a digital signal or bus, a blank stimulus plot appears. Click and draw the stimulus.

Labeling plots

You can place labels to annotate a plot. Labels can be placed anywhere on the stimulus window, including outside the current plot window where they are not visible. Unless you specifically set the plot region, Stimulus Editor rescales the plot so that all labels are visible.

You can place the following labels:

arrow	Draws a line segment with an arrowhead on the end. See To draw an arrow.
box	Box draws a box by specifying two diagonal corners. See To draw a box.
circle	Circle draws a circle by specifying the center of the circle and a point on the circle. A circle always remains round. See To draw a circle.
ellipse	Draws an ellipse by dragging and turning. Ellipses scale with the plot both in eccentricity and inclination angle. See To draw an ellipse.
line	Draws a straight line from one specified point to another. See To draw a line.
poly-line	Draws multiple connected line segments. All the line segments created during a single poly-line operation become a single poly-line label. See To draw a poly-line.
text	Places text within the current plot. See To place text.

To move a label

1. Click to select a label. Shift+click to select several labels.
2. Drag the label to a new location.
3. Release to place the label.

To delete a label

1. Click to select a label. Shift-click to select several labels.
2. From the Edit menu, select Delete.

To place text

1. From the Tools menu, point to Label and select Text.
2. In the Text Label dialog box, type a text string in the box. You can type up to 124 characters, including spaces.
3. Click OK.

4. Move the cursor where you want the text to be placed.
5. To place the text, click the mouse.

To draw a line

1. From the Tools menu, point to Label and select Line.
2. Click the start point for the line.
3. Move the cursor to the end point for the line.
4. Click the mouse.

To draw a poly-line

1. From the Tools menu, point to Label and select Poly-line.
2. Click the start point for the line.
3. Move the cursor to the first end point for the line.
4. Click the mouse.
5. Click for the next end point.
6. To complete the poly-line label, right-click.

To draw an arrow

1. From the Tools menu, point to Label and select Arrow.
2. Click the start point for the arrow. An arrowhead appears on the movable end.
3. Move the cursor to the end point to place the arrowhead.
4. To drop the end of the arrow, click the mouse.

To draw a box

1. From the Tools menu, point to Label and select Box.
2. Click the first corner of the box.
3. Move the cursor to the other corner of the box.
4. To drop the end of the box, click the mouse.

To draw a circle

1. From the Tools menu, point to Label and select Circle.
2. Click the center of the circle.
3. Move the cursor to the outside point of the circle, defining the radius.
4. To set the radius of the circle, click the mouse.

To draw an ellipse

1. From the Tools menu, point to Label and select Circle.
2. Type the inclination angle. Click OK.
3. Click to place the center of the ellipse.
4. Move the cursor to size and shape the ellipse.
5. To drop the end of the ellipse, click the mouse.

Using plot windows

You can have one or more plot windows open. Each plot window can contain one or more plots. Each plot can contain both analog and digital stimuli.

Each time you open a new data file, a new plot window is created.

To print plots

1. Do one of the following:
   - ❑ To print one copy of the current plot window using the print defaults, click the Printer button on the toolbar
   - ❑ From the File menu, select Print.
2. Select the plots you want to print.
3. If needed, select a printer and printer information.
4. Click OK.

To modify the window title

1. From the Window menu, select Title.
2. In the box, type the new name.
3. Click OK.

Using multiple plots

You can display multiple plots at the same time in one window. When several plots are in the same window, you can select one, delete one, or work with them as synchronized or unsynchronized.

Plots from the same set of data are automatically synchronized. Using unsynchronized plots allows you to independently apply different scales.

Unsynchronizing plots releases the selected plot to have its own time axis. Plots that are sharing time axes are always displayed together, one above the other.

To add a new plot

1. Click in the window to which you want to add the plot.
2. From the Plot menu, select Add Plot.

   The new plot appears above the selected plot in the window. Now you can add traces.

To select the current plot

1. Click in the plot you want to be current.

To delete a plot

1. Click in the plot you want to delete.
2. From the Plot menu, click Delete Plot.

To unsynchronize plots

To unsynchronize a plot

1. Click the plot you want to become unsynchronized.

2. From the Plot menu, select Unsync Plot.

Important

After you have unsynchronized a plot, you cannot resynchronize it. You must delete the plot and add a new plot.

If the selected plot is the middle plot of three plots sharing an time axis, then the middle plot is moved to the top position.

Editing a Stimulus

Once a stimulus has been added to the plot, it is easily edited. Formula based stimuli like EXP, Pulse, SFFM, Sin, and Clock can be edited by double-clicking their names on the plot.

Signals, Buses, and PWLs can be drawn interactively. Stimuli can be renamed and copied from other stimulus libraries and removed from the current library

Note: Only one PWL can be edited in any stimulus library at a time.

Once the PWL is activated, new transitions can be drawn on it just as you do for digital stimuli.

To display an existing stimuli in the current plot

1. Do one of the following:
   - ❑ On the toolbar, click the Add Stimulus button
   - ❑ From the Stimulus menu, select Get.
2. In the Get Stimulus dialog box, click to select the name or names of the existing stimuli you want to get.
3. Click OK.

   The stimuli are displayed.

To copy a stimulus

1. From the Stimulus menu, select Copy.
2. In the Open dialog box, select the name of the file from which to copy the stimuli.
3. Click Open.
4. In the Copy Stimulus dialog box, click to select the names of the stimuli to copy.
5. Click OK.

Note: If a name of a copied Stimulus Editor already exists, you are prompted about overwriting the name. Click the appropriate button.

Note: If you are copying stimuli from a file that is being edited in another window, the stimuli are copied as they were when they were last saved to disk.

To remove a stimulus

1. From the Stimulus menu, select Remove.
2. In the Remove Stimulus dialog box, click to select the names of stimuli you want to remove.

   Note: If you selected a stimulus before step 1, this dialog box does not appear.
3. Click OK.

To rename a stimulus

1. From the Stimulus menu, select Rename.
2. In the Rename Stimulus dialog box, click to select the names of stimuli you want to remove.

   Note: If you selected a stimulus before step 1, this dialog box does not appear.
3. Click OK.
4. In the next Rename Stimulus dialog box, type the new name of the stimulus.
5. Click the Rename button.

   The stimulus appears in the plot window with the new name.

Editing digital stimuli

Digital stimuli (except Clocks) can be graphically edited by drawing new transitions, or selecting and dragging or deleting existing transitions.

Note: Digital stimuli can be edited at any time.

Analog stimulus

EXP	Use for an exponential waveform
Pulse	Use for a pulse waveform
PWL	Use for a piecewise linear waveform
SFFM	Use for a frequency modulated waveform
SIN	Use for a sinusoidal waveform

Digital stimulus

Clock	1 bit wide digital stimulus
Signal	1 bit wide digital stimulus
Bus	1 or more bits wide digital stimulus

To add a new transition

1. Do one of the following:
   - Click the Add button
   - From the Edit menu, select Add.
2. If you are adding Buses, make sure that the digital value field of the toolbar contains the correct value for the transition you want to add.
3. Click the digital stimulus you want to edit. A new transition appears.
4. Drag the new transition to a new location.
5. To continue adding transitions, repeat steps 2 and 3.
6. To stop adding transitions, right-click.

To move transitions

1. Click a transition in the digital stimulus in the plot window. A handle appears indicating the transition is selected.
2. Use Shift+click to select more than one transition. Transitions may be selected simultaneously on multiple stimuli.
3. Drag the transitions to the new position.

To delete transitions

1. Click a transition in the digital stimulus in the plot window. A handle appears indicating the transition is selected.
2. Shift+click to select more than one transition. You can select multiple transitions simultaneously on multiple stimuli.
3. From the Edit menu, select Delete.

To edit a transition

1. Click a transition in the digital stimulus in the plot window. A handle appears indicating the transition is selected.
2. Do one of the following:
   - ❑ On the toolbar, click the Edit Attributes button
   - ❑ Double click the transition.
   - ❑ From the Edit menu, select Attributes.
3. The Stimulus Attributes dialog box appears. Edit the timing and value of the selected transition.
4. Click OK.

Editing stimulus attributes

You can modify the currently selected stimulus in the plot window. You cannot modify several stimuli at the same time.

You can set the values of formula based stimuli and preview the changes before you accept them.

For digital stimuli, set the width of the stimuli, the radix in which the stimulus is displayed, and whether or not the repeat bars are displayed.

For PWLs, set the TIME_SCALE_FACTOR and the WIDTH_SCALE_FACTOR for compatibility with PSpice.

To change a stimulus in the plot window

1. To select a stimulus, do one of the following:

- ❑ Click the name of the stimulus in the plot window. On the toolbar, click the Edit Attributes button
- ❑ Double-click the stimulus name.
- ❑ Click the name of the stimulus in the plot window. From the Edit menu, select Attributes.

Depending on the type of stimulus selected, one of two dialog boxes appears.

2. In the dialog box, do one or more of the following:
   - ❑ To edit an attribute, click the box of the value to be changed and type the new value.
   - ❑ To preview the change to the current plot, click the Apply button.
3. To save the change, click OK.

Editing Piecewise Linear (PWL)

PWLs can be graphically edited by drawing new points, or selecting and dragging or deleting existing points.

Note: Only one PWL can be edited in any stimulus library at a time.

Once the PWL has been activated, handles appear for all points. New points can be added using the Edit menu.

To add points

1. Select a PWL by clicking the name in the Plot legend.
2. From the Edit menu, select Activate.
3. Do one of the following:
   - ❑ Click the Add button
   - ❑ From the Edit menu, select Add.
4. Click the PWL stimulus. New points appear.
5. To end adding points, right-click.

To move points

1. Select a PWL by clicking the name in the Plot legend.

2. From the Edit menu, select Activate.
3. Do one of the following:
4. To select one point, click the point.
5. To select several points, Shift+click handles or drag a box around the points.
6. Drag points to the new position.

To delete points

1. Select a PWL by clicking the name in the Plot legend.
2. From the Edit menu, select Activate.
3. Do one of the following:
   - To select one point, click the point.
   - To select several points, Shift+click the handles or drag a box around the points.
4. From the Edit menu, select Delete.

Editing labels

Labels can be edited. They can also be moved to another location.

Label text can be edited and the angle of inclination can be changed.

To edit labels

1. Double-click a text label or and an ellipse label.
2. Make your changes in the dialog box that appears.
3. Click OK.

To move labels

1. Click to select the label.
2. Drag the label to the new location.
3. Drop the label.

Setting Stimulus Editor Options

You can set preferences to reflect how you use Stimulus Editor.

Tip

If you frequently set an option to a non-default value, change the default value to the one you use.

To set the options

1. From the Tools menu, select Options.
2. The Options dialog box appears. Select or click the following options and click OK.

Auto-Fit Time Axis	Selects if the time axis should be automatically scaled while you are editing stimuli.
Auto-Fit Y Axis	Selects if the Y axis should be automatically scaled while you are editing stimuli.
Bus Radix	The default radix for displaying buses. Select binary, decimal, hexadecimal, or octal from the list.
Bus Width	The default width for buses created by choosing New from the Stimulus menu.
Displayed Data Range	■ Time Axis: The beginning and ending time axis range values. ■ Y Axis: The beginning and ending Y axis range values.
Iterations Shown for Infinite Loops	The number of repeating series of cycles displayed on waveforms for any infinitely repeating stimulus. Note that repeat loops cannot be created within Stimulus Editor. You must edit the file using a text editor. After you have edited the file, open the file in Stimulus Editor.
Display Repeat Bars	Turns display of repeat bars on and off. Repeat bars define the extent of a repeat loop. Note that repeat loops cannot be created within Stimulus Editor. You must edit the file using a text editor. After you have edited the file, open the file in Stimulus Editor.

Use Symbols on Analog Traces	■ Selecting Auto puts data symbols on traces to distinguish one trace from another. The criteria for drawing traces is: ❑ if more traces are displayed than there are colors for drawing traces, and ❑ if there are less than nine traces. ■ Selecting Never clears drawing trace symbols. ■ Selecting Always selects drawing trace symbols if there is at least one trace displayed in the active plot window. Each trace is marked using a symbol matching the color or token of the associated variable.

Status bar

Turns the status bar at the bottom of the screen on and off.

Toolbar

Turns the toolbar button display on and off.

Syntactic Repeats

The display of repeat bars.

If selected, repeat bars are displayed using the delays to a new transition value as the basis for the display of the repeat bar.

If cleared, the values of the transitions in the loop are used as the basis for the repeat bar display.

Setting plot options

You can set the numerical ranges for the current plot. The values you can set include the displayed range of data on the plot and the extent of the scrolling region for the plot. You can also set the minimum resolution for allowed PWL points and digital transitions.

To set the plot options

1. Do one of the following:
   - ❑ On the toolbar, click the Axis button

- From the Plot menu, select Axis Settings.

2. In the Axis Settings dialog box type or select the following information:
   - Displayed Data Range: Sets the ranges of the X and Y axes. To change the values, type the new values in the boxes. These are the default values for a new plot.
   - Extent of the Scrolling Region: Sets the scrolling range.
   - Minimum Resolution: Sets the minimum resolution to which you can add points or transitions, effectively setting a “snap grid.” For example, if the minimum resolution was set to 1ns, a point at 3.4ns cannot be added. The point snaps to 3ns and the point or transition is added there.
3. Click OK.

Selecting print options

You can select page setup options to change the way plots look when they are printed.

To select page setup options

1. From the File menu, select Page Setup.
2. In the Page Setup dialog box select or type the following options:
   - In the Margins area, type the margin spacing.
   - In the Plots per page, select how many plots are printed on each page. Select 1 to 9 per page.
   - To put a border on the page, select the Draw Border option box.
   - To put the plot title on the page, select the Draw Plot Title option box.
3. To add a header and/or a footer, click the Header or Footer button.
   - The three boxes: Left Side, Center, Right Side are header or footer information that is left justified, centered, and right justified. Type the information into the appropriate box. You can use header and footer codes for certain information.
   - Press Ctrl+Enter to start a new line.
   - To close the dialog box, click OK.
4. To close the Page Setup dialog box, click OK.
5. Click OK.

Reference Information

Using logging commands

Command logging creates a file of the commands to perform some tasks on the screen. Command files play back logged commands.

To create a command log file

1. From the File menu, select Log Commands.
2. Type a name for the command file in the File Name box. All actions are stored in the command log file.
3. Click OK.
4. When you are done, stop command logging by choosing Log Commands again.

To run a command log file

1. From the File menu, select Run Commands.
2. Select the file you want from the list.
3. Click OK.
4. The file is immediately played.

Using parameters

Parameters and values are used only by Stimulus Editor when displaying a stimulus that is a function of a parameter.

Stimulus Editor allows for expressions containing parameters in all stimulus specifications. These parameter values are stored in the stimulus library but they are not actually part of the stimulus.

To save a parameter

1. From the Tools menu, select Parameter. The Parameters dialog box appears.
2. In the box, type the definition of the parameter.

3. Click Save.
4. Repeat to define more parameters.
5. Click OK.

To use a parameter

1. Click a stimulus that is a function of a parameter.
2. From the Tools menu, select Parameters.
3. In the Parameters dialog box, click the name of the parameter you want to use.
4. Do one of the following:
   - To apply the selected parameter and leave the Parameter dialog box open, click the Apply button.
   - To use the selected parameter and close the Parameter dialog box, click OK.

To delete a parameter

1From the Tools menu, select Parameters.

2In the Parameters dialog box, click the name of the parameter you want to delete.

3Click the Delete button.

Getting around

Stimulus Editor provides a set of keyboard shortcuts that are shortcuts to common actions.

Add an item	ALT+A
`Create new stimulus`	ALT+N
Redraw the screen	CTRL+L
Close the application	ALT+F4
Remove a stimulus	ALT+Delete

Delete an item	Delete
	CTRL+D
Save a file as	F12
Edit attributes	ALT+T
Save a file	Shift+F12
Go back to the previous view	CTRL+P
Zoom in to the selected area	CTRL+A
Insert a stimulus	Insert
Zoom in	CTRL+I
Open a file	CTRL+F12
Zoom out around a specified point	CTRL+O
Print a file	CTRL+Shift+F12
Zoom out so that all data on the screen is shown	CTRL+N

New button

Click to open a new plot window.

Open button

Click to open a stimulus library.

Save button

Click to save a stimulus library.

Print button

Click to print the active plot window.

Zoom buttons

Click to zoom the displayed view in or out.

View Area button

Click to zoom in the selected area.

View Fit button

Click to zoom out so that all the stimuli in the selected plot are visible.

Axis Settings button

Click to display the Axis Settings dialog box.

New Stimulus button

Click to display the New Stimulus dialog box.

Get Stimulus button

Click to display the Get Stimulus dialog box.

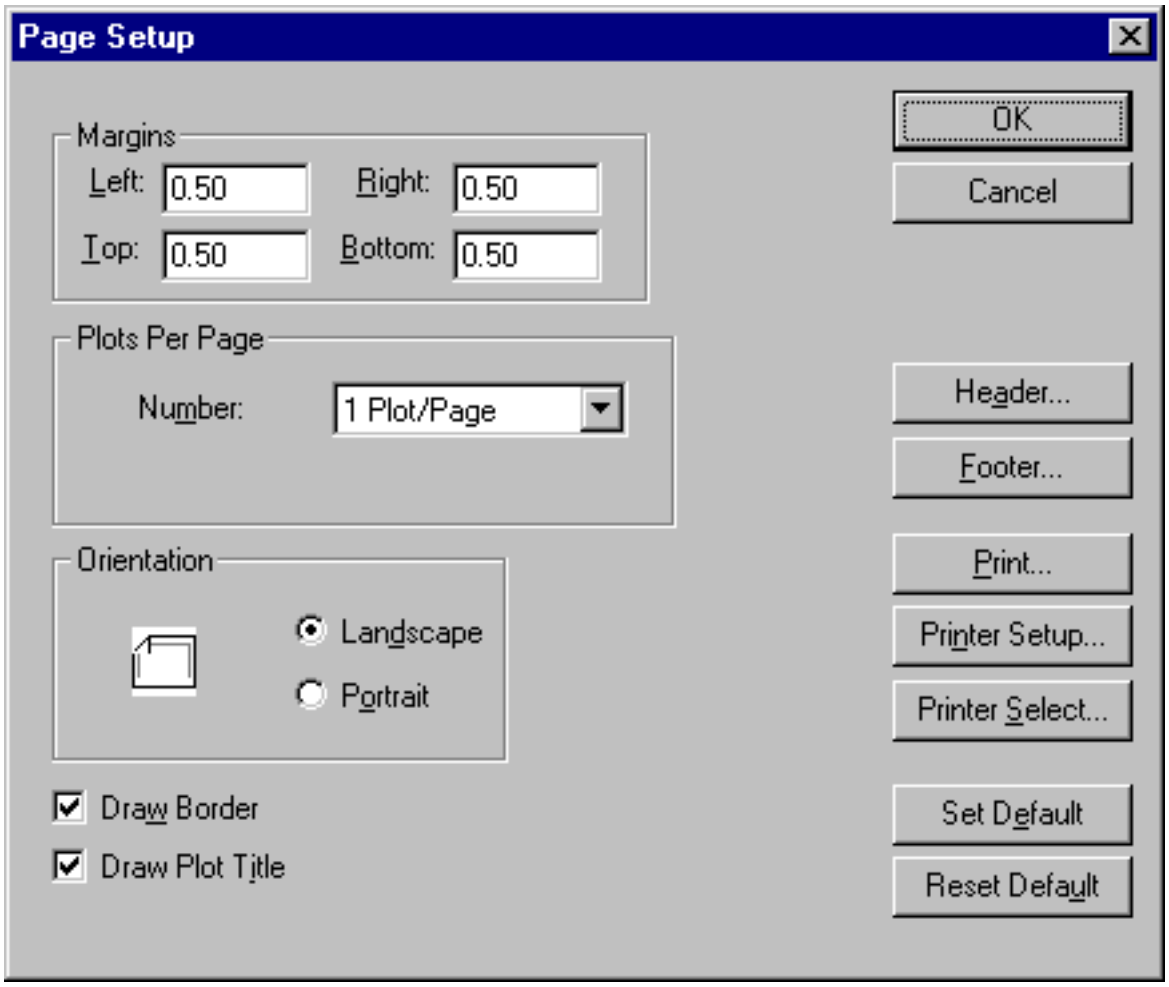
Edit Attributes button

Click to edit stimulus attributes.

Add button

Click to add a new point to a stimulus.

Page Setup dialog box



The following topics explain the various options of the Page Setup dialog box.

Default Printer

Selects the default printer.

Specific Printer

Selects another printer from the list.

Margins

Sets the size of the four margins in inches.

Plots Per Page

Selects how many plot windows should be placed on a single sheet of paper. The paper can be divided evenly into the number of sections specified by the control.

Orientation

Selects if the printed information is to be have the short edge of paper oriented vertically (landscape), or having the long edge of paper oriented vertically (portrait).

Cursor Information

Selects the placement of the pointer value information on the printed page. The value information is only available when the pointers are displayed in a plot window.

Draw Border

Select if a border is drawn around each individual plot on the page.

Draw Plot Title

Shows the plot title printed in each plot, irrespective of the plot area on the hard copy page.

header and footer codes

Set the header and footer information for all printed pages.

Type information into a box. Press Ctrl+Enter to start a new line.

Special codes can be inserted into any of the edit fields.

Code	Information
&D	Current date

`&T`	Current time
`&N`	Page numbering in print job

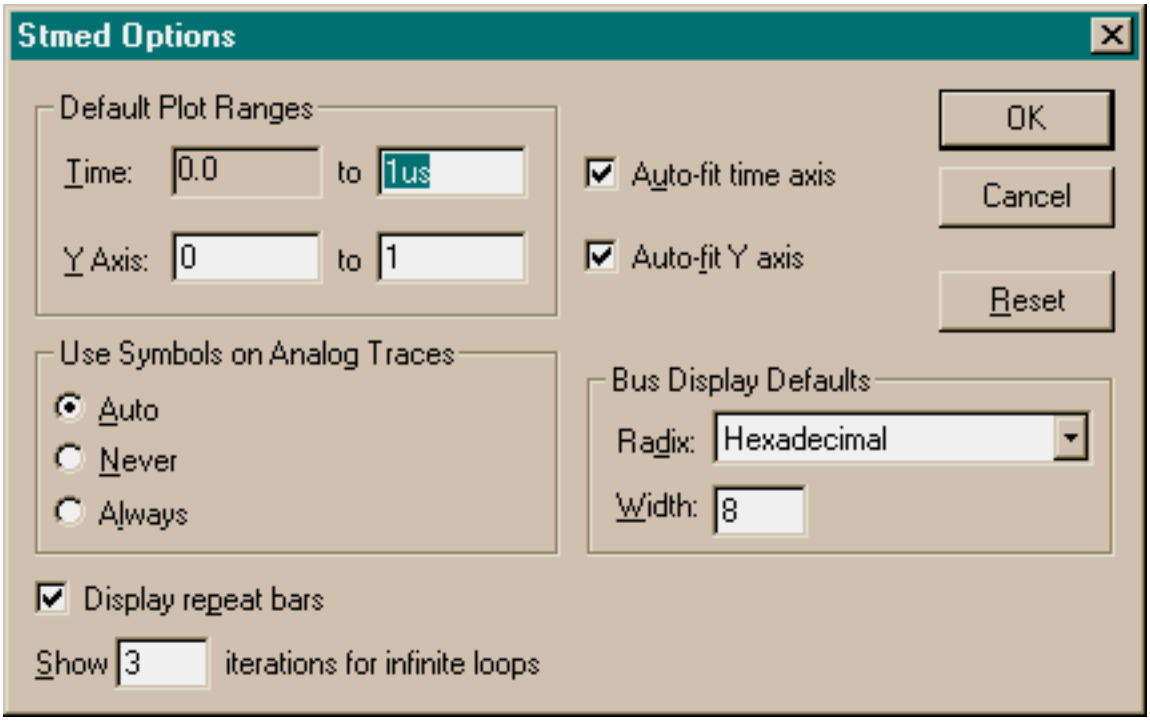
Set Default

Saves the current header and footer settings, so they can be used as the defaults the next time Header and Footer is selected.

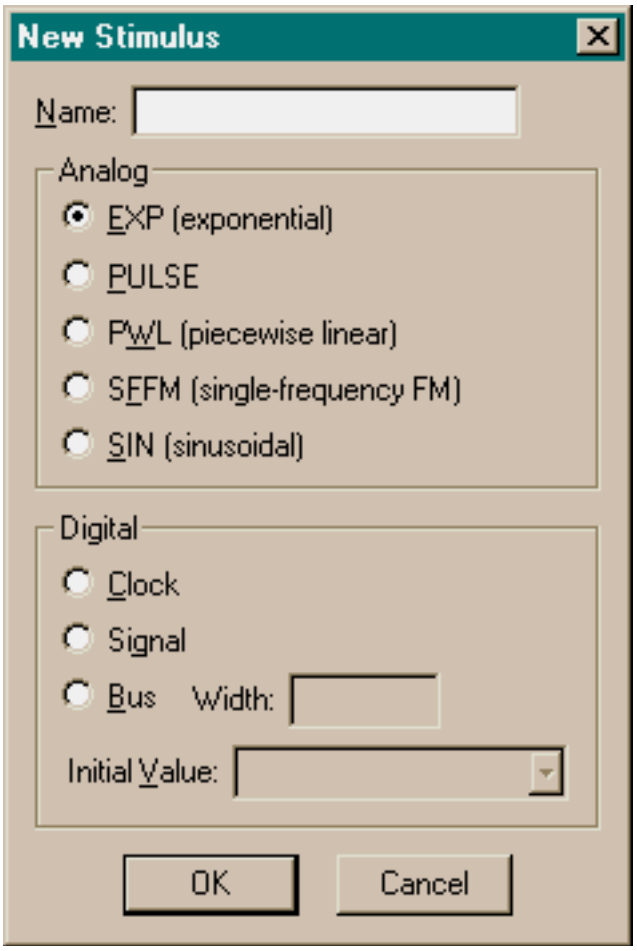
Reset Default

Restores the original default settings.

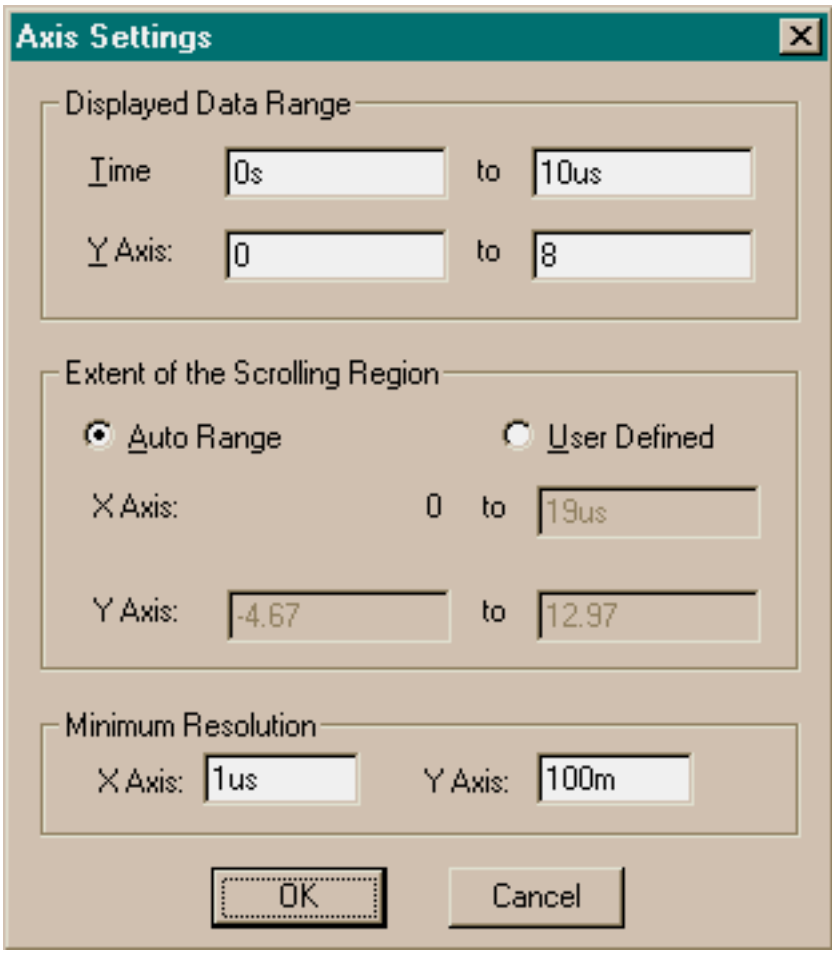
Options dialog box



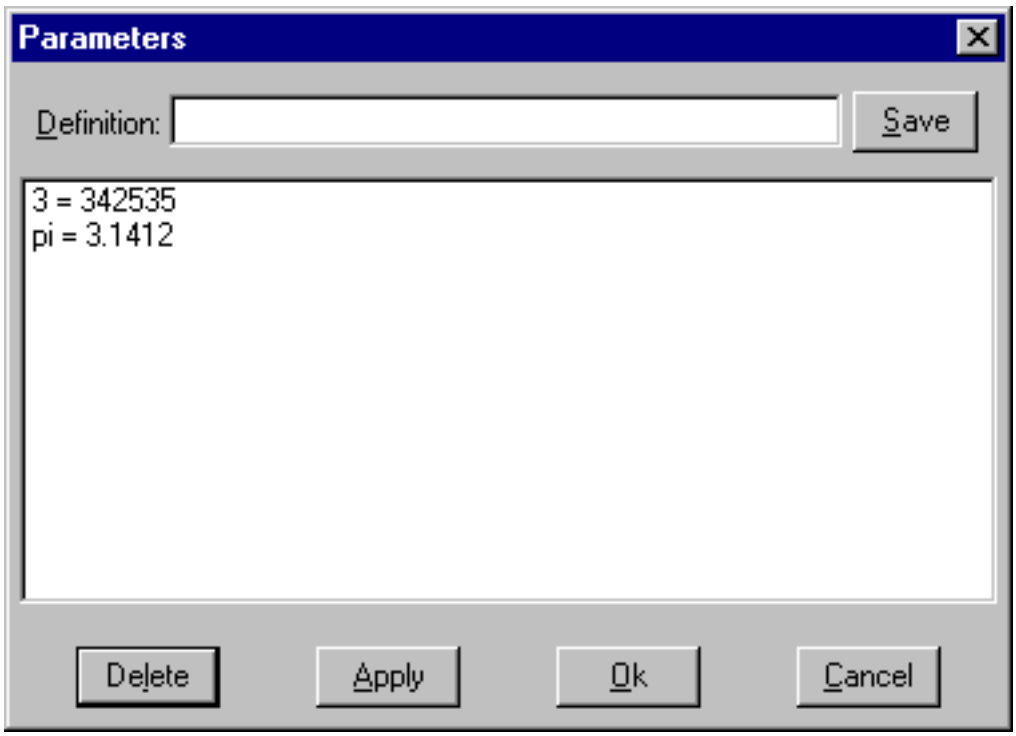
New Stimulus dialog box



Axis Settings dialog box



Parameters dialog box



Creating unnamed stimulus parts from within Capture

1. Create a stimulus part using Capture's part editor without giving it a name.
2. From the Edit menu, choose Stimulus.

   The Stimulus Editor looks for a design stimulus file called <DESIGN>.STL in the design directory. If one is found, the Stimulus Editor opens it and displays the last set of stimuli viewed from this file. If one is not found, the Stimulus Editor creates a new file.
3. The New Stimulus dialog box appears and prompts you to enter the name and type of the stimulus.

   The Stimulus Editor draws the stimulus.
4. From the File menu, choose Close. You are prompted to save the stimulus and update the Capture design.