Parasolid V13.0

PS/Workshop V2.1 User Guide

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Important Note

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Unigraphics Solutions™

Parker's House
46 Regent Street
Cambridge CB2 1DP
UK
Tel: +44 (0)1223 371555
Fax: +44 (0)1223 316931
email: ps-support@ugs.com
Web: www.parasolid.com

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Introduction to PS/Workshop

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PS/Workshop is a Parasolid prototyping tool and model viewer that makes prototyping Parasolid-powered applications and viewing XT files a simple task in Windows NT.

As well as providing high performance visualization of XT files, PS/Workshop has an extensible architecture that lets you create add-on modules. These modules give you access to the full range of Parasolid functionality, and can be developed easily using the PS/Workshop Wizard in Microsoft Visual Studio. For more information on developing your own modules for use with PS/Workshop, see the *PS/Workshop Developer Guide*.

1.1 Installing and running PS/Workshop

PS/Workshop can be found on the Parasolid Software for PC Platforms CD-ROM. To install PS/Workshop:

- Place the Parasolid Software for PC Platforms CD-ROM in your CD-ROM drive, *while holding down the Shift key* to override the CD auto-run.
- Use Windows Explorer to browse to the `PSWORKSHOP` folder on the CD-ROM.
- Double-click the file `PSWORKSHOP.EXE` and follow the on-screen instructions.

To run PS/Workshop, click on the Windows **Start** button and choose **Programs > Parasolid > PSWorkshop > PSWorkshop**.

1.2 The PS/Workshop window

PS/Workshop has a multi-document interface, enabling you to open several files at once. Figure 1–1 shows PS/Workshop with four separate files open.

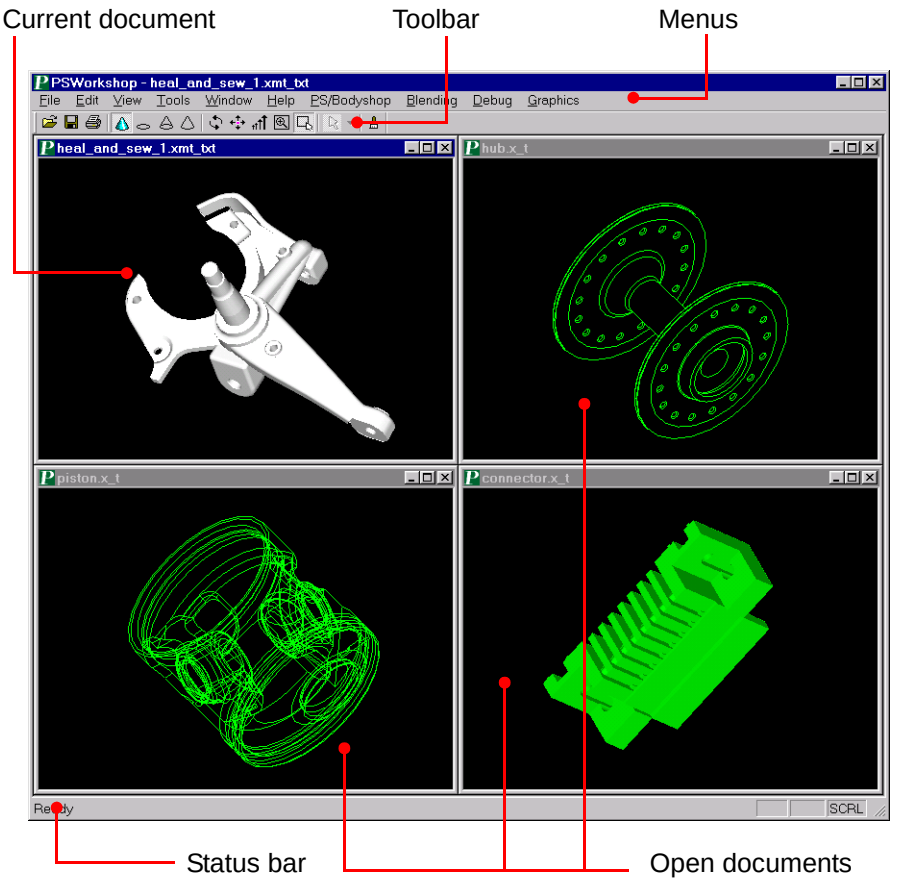

Figure 1–1 The PS/Workshop window

In common with many other Windows applications, PS/Workshop contains a toolbar that contains buttons giving you quick access to common tasks. This toolbar can be docked against any edge of the PS/Workshop window, or left as a free-floating window in its own right. To move the toolbar from its current position, just click and drag its handle. To remove the toolbar altogether, choose **View > Toolbar**. Choose the same command to display it again.

PS/Workshop also contains a status bar that is used to display messages, such as short descriptions of a highlighted menu command. To turn the status bar on or off, choose **View > Status Bar**.

PS/Workshop contains a number of menus, described below.

- The **File** menu contains commands for manipulating and opening XT files. See Chapter 2, “Handling Files”.
- The **Edit** menu contains commands that let you control the colors of entities in the model, and which entities are selected. See Chapter 4, “Editing Models”.
- The **View** menu contains commands to change the way that the current model is displayed. See Chapter 3, “Viewing Models”
- The **Tools** menu is used to configure different options in PS/Workshop. See Chapter 5, “Setting Options”.
- The **Help** menu gives you access to online versions of the PS/Workshop documentation.

If any modules have been loaded in PS/Workshop, other menus may be available.

- Some modules may contain online help that you can access from the module’s user interface.
- Printable documentation for each module can be found in the `Help` folder of the PS/Workshop installation folder, and from the **PSWorkshop** item on the Windows **Start** menu. You need Adobe Acrobat Reader to be able to read or print this documentation – see `http://www.adobe.com/` for information on how to obtain this if you do not already have it.

To find out how to load a module in PS/Workshop, see Chapter 6, “Loading Modules”.

Note: You can find out the version of PS/Workshop and the build of Parasolid that PS/Workshop is using by choosing **Help > About PS/Workshop**.

Handling Files 2

2.1 Introduction

The **File** menu in PS/Workshop contains commands for opening, closing, and managing files. A number of these commands are also available on the toolbar. This chapter describes how to use these commands.

2.2 Opening and closing files

Click  or choose **File > Open** to open a file and read the content into PS/Workshop. Valid file types and extensions are shown below. You can load both binary and text-based Parasolid files, as well as PS/Workshop V1 modules.

File contents	Type	Extensions
Parasolid Model	text	`.x_t`, `.xmt_txt`
Parasolid Model	binary	`.x_b`, `.xmt_bin`
PS/Workshop V1 module	binary	`.dll`

When a Parasolid model is loaded, it is displayed in PS/Workshop. To close the file without exiting PS/Workshop, choose **File > Close**.

When a PS/Workshop V1 module is loaded a message indicates the success or failure of the loading of the DLL. If successful, the module can be used on documents subsequently opened.

Note: Functionality for loading V1 modules is provided for backward compatibility only. See Chapter 6, “Loading Modules” for more information on loading modules.

2.3 Loading part data

PS/Workshop also contains commands that let you load model data into a file that is already open.

- Choose **File > Import** to load parts from a file and add them to the current document.
- Choose **File > Combine All Parts** to combine all of the currently open parts to make a single, new document.

2.4 Saving files

Click  or choose **File > Save** to save any changes you have made to the current document.

Choose **File > Save As** to save the file under a different name and, optionally, in a different format. Choose a new filename and format (if desired) in the dialog box that opens. All of the following formats are supported:

Format	File extension
Parasolid text	`*.x_t`
Parasolid binary	`*.x_b`
RealityWave	`*.xgl`
Windows bitmap	`*.bmp`
Windows enhance metafile	`*.emf`
JPEG files	`*.jpg`

2.5 Printing files

There are three commands that let you print documents and control the appearance of the printed output.

- Click  or choose **File > Print** to print the current view of the active document. This command displays the printer dialog box for your system.
- If you want to see a preview of the image before printing it, choose **File > Print Preview**.
- Choose **File > Print Setup** to set up the default printer for PS/Workshop.

To save printer resources you are advised to set the background color to clear. See Section 4.3, “Editing colors”, for details.

Viewing Models 3

3.1 Introduction

This chapter describes the different ways that you can change the way a model is viewed in PS/Workshop. It describes how you can alter the direction and scale with which a model is viewed, and how you can alter the appearance of the model itself by using different types of view.

3.2 Altering view direction and scale

PS/Workshop offers a wide variety of tools to alter the direction from which a model is viewed, or the size of the image. Many of these tools are available directly from the toolbar.

3.2.1 Changing the direction of view

The following tools are available to alter the position that a model is viewed from:

Tool	Description
Rotate	To rotate the model, click  or choose **View > Modify > Rotate**. Click and hold down the mouse button and move the mouse to rotate the model. All view modes, Wireframe, Wireframe plus silhouettes, Hidden Line and Shaded, are supported. View dependent silhouette calculation is suspended while the view is changing. It is recomputed when the mouse button is released.
Pan	To pan (scroll the current view of) the model, click  or choose **View > Modify > Rotate**. Click and hold down the mouse button and move the mouse to pan the model.

3.2.2 Making the image smaller or larger

The following tools let you alter the size of the image in PS/Workshop:

Tool	Description
Zoom	To zoom in and out of the model, click or choose **View > Modify > Zoom**. To zoom in (make the image larger), click and hold the mouse button while moving the mouse up. To zoom out (make the image smaller), click and hold the mouse button while moving the mouse down.
Fit to Screen	To fit the entire model in the current window, click or choose **View > Modify > Zoom to Fit**. Select this icon to change the scale factor of the view so that the model fills the window in which it is displayed.
Zoom to Window	To zoom in to a specific area of a document, click . Define the area of the document you want to view by clicking and holding down the mouse button in the top left corner and dragging the mouse to the bottom right corner. This zooms the display such that the area of the selected rectangle fills the window.

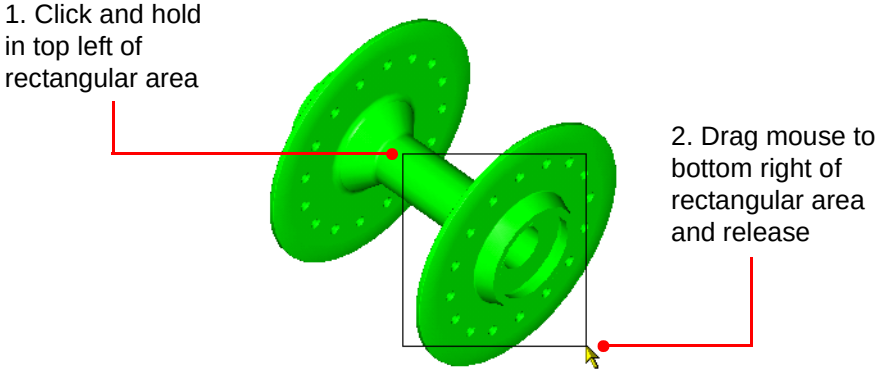

Figure 3–1 Selecting a rectangular area to zoom in to

Note: When is selected, you cannot select any entities in the document. See Section 4.2, “Selecting entities”, for information about selecting entities.

3.2.3 Using standard views

A number of standard views are provided as menu commands in PS/Workshop. By choosing the relevant command in the **View > Standard Views** submenu, you can switch instantly between the following view directions:

- Isometric
- Front
- Back
- Top
- Bottom
- Left
- Right

3.3 Altering the appearance of the image

3.3.1 Altering the line width of edges

You can use the commands in the **View > LineWidth** submenu to change the width of lines used to display edges in a model. Choose any value from 1 (the default) to 5.

3.3.2 Altering the way the image is rendered

PS/Workshop provides a number of different ways of rendering a model on the screen. These are illustrated in Figure 3–2. If a part has a color attribute attached, then that color is used in the rendered image. Otherwise, the default body color, as specified in the PS/Workshop Options dialog, is used.

These colors, together with the document's background color, can be edited as described in Section 4.3, "Editing colors". Any model colors set within PS/Workshop are saved back as attributes to the model.

The following modes are provided in PS/Workshop:

Mode	Description
Wireframe	Click  or choose **View > Display > Wireframe** to display the document in wireframe mode. This mode renders every edge on the model on the screen.
Wireframe + Silhouettes	Click  or choose **View > Display > Wireframe + Silhouettes** to display the document in wireframe silhouette mode. Silhouette edges are edges that are implied by the view, rather than being real edges in the model itself. Their locations depend upon the view parameters and are computed as the view changes.
Hidden Line	Click  or choose **View > Display > Hiddenline** to display the document in hidden line mode. This mode shows only those parts of real and silhouette edges that can be seen from the current view direction. Any part of an edge that is obscured by some other part of the model is not drawn. The results depend upon the view parameters and are computed as the view changes.
Shaded	Click  or choose **View > Display > Shaded** to display the current model in shaded mode, as shown in Figure 3–2. Shaded mode can also be combined with either Wireframe or Wireframe + Silhouettes modes. These combined modes are known as **Dual Display Modes**.

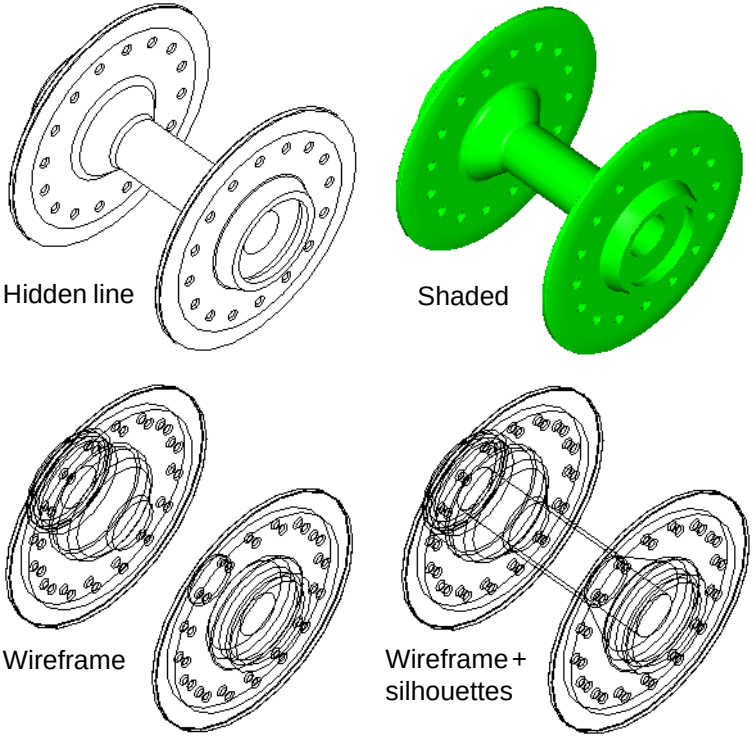

Figure 3–2 Wireframe, wireframe + silhouettes, hidden line, and shaded modes

3.3.3 Re-rendering the view

Zooming in on a portion of the model can produce a coarse screen image, especially if the model in the viewing area is curved. Click to recompute a smooth view for the current view parameters.

Editing Models 4

4.1 Introduction

This chapter describes some of the tools that PS/Workshop provides to let you edit a model. It also describes how to select entities in a model: sometimes editing functions will only work on selected entities in a model.

Note: Many PS/Workshop modules also provide functionality that lets you edit a model. For example, a given module might let you add blends to a model. This chapter does not describe the functionality of individual modules: see the online documentation for each module, as described in Section 1.2.

4.2 Selecting entities

Many editing functions – especially those provided by PS/Workshop modules – require you to select one or more entities in the model. Once selected, the editing function operates solely on the selected entities.

To select entities in a model, click  on the toolbar to enter selection mode. When this button is selected, you can select combinations of bodies, faces, edges and vertices in the current view by clicking on them.

To pick …	Do this …
a face	Pick within the area of a face, well away from a boundary.
an edge	Place the cursor along the edge and away from a bounding vertex.
an item that is obscured by other parts of model	Use the Rotate  and Zoom  buttons to change the view so that it is easier to pick the desired item.

If you click  to leave selection mode, any selected entities are deselected.

Selected entities are displayed in the color specified in the Options dialog. See Chapter 5, “Setting Options”, for details.

Note: Selection mode is not available when you have chosen the Zoom to Window tool.

4.2.1 Choosing which entities can be selected

You can choose which topological types you want to be able to select when in selection mode from the pull-down menu immediately next to the button. Click on the arrow to display the menu, and then choose a topological entity to toggle the ability to select that entity. You can choose to select either

- any mutually inclusive combination of faces, edges, and vertices, or
- bodies

By default, you can select faces, edges and vertices.

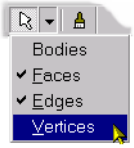

Figure 4–1 Choosing which entity types can be selected

The set of entity types that can be selected at any time is referred to as the **selection filter**.

4.2.2 Quick entity selection

The following commands are available to quickly select or deselect entities in a model. In each case, only those entity types currently in the selection are selected when using these commands.

Command	Description
Edit > Select All	Selects all the entities in the model.
Edit > Unselect All	Deselects all the entities in the model.
Edit > Invert Selection	Inverts the current selection: those entities that are selected become deselected, and those that are not selected become selected.

4.3 Editing colors

PS/Workshop provides a number of commands for changing the color of different parts of a model. These commands are all available in the **Edit > Colour** menu.

Command	Description
All Entities	Change the color of all entities in the document.
Selected Entities	Change the color of all selected entities in the document.
Background	Change the background color of the current document.
Edges In Dual Display	Modify the color used to display edges in Dual Display Modes (i.e. when  or  are switched on at the same time as ).
Selection Colour	Modifies the default selection color for entities. You can also modify this color in the Options dialog. See Chapter 5, “Setting Options”, for details.

4.4 Editing transparency of faces

You can use the commands in the **View > Transparency** submenu to change the transparency of any selected faces in the model. Transparency is expressed as a percentage: 0% is opaque, 100% is clear.

Setting Options 5

5.1 Introduction

This chapter describes the range of options that you can set in PS/Workshop. These options are used by default on any document that you subsequently open.You can set the following groups of options:

- General options – see Section 5.2
- Default colors – see Section 5.3
- Graphics options – see Section 5.4
- Transmit and receive options – see Section 5.5
- Default file locations – see Section 5.6
- Symmetric multi-processing (SMP) options – see Section 5.7
- Module loading – see Section 5.8

Each group of options is available in a separate tab in the Options dialog. Choose **Tools > Options** to open this dialog.

5.2 General

The General tab lets you specify the sensitivity of mouse controls for the rotate, pan and zoom modes in PS/Workshop. Move any slider to the right to increase the sensitivity for that mode.

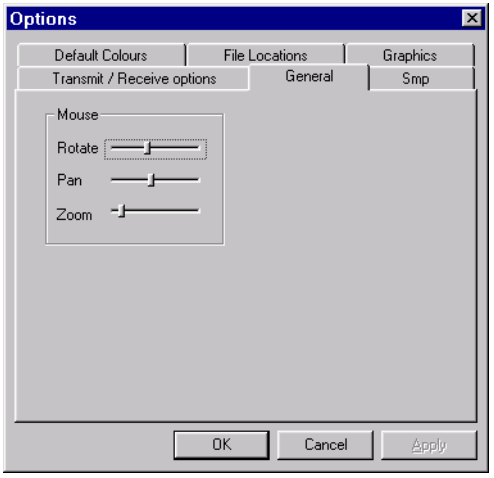

Figure 5–1 General options

5.3 Default colors

The Default Colours tab lets you specify the default colors used for selected entities, bodies, the document background, and edges when in Dual Display Modes. Click on the color you want to change and choose a new color in the Color dialog that opens.

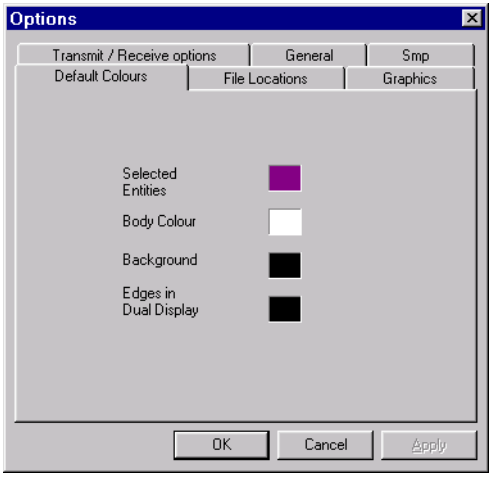

Figure 5–2 Default color options

5.4 Graphics

The Graphics tab is for specifying how certain graphic properties are displayed in PS/Workshop.

- The **Hidden Line mode** panel lets you choose to display hidden lines in Hidden Line mode. You can also choose the color to display hidden lines in, and whether hidden lines should be solid, dashed, or dotted.
- The **View** panel lets you control how models are viewed in PS/Workshop. When **Display axes** is turned on, a small triad indicating the direction of the x, y, and z axes appears in the bottom right hand corner of each open document. You can choose which view is used when opening a document from the **Initial view style** list.

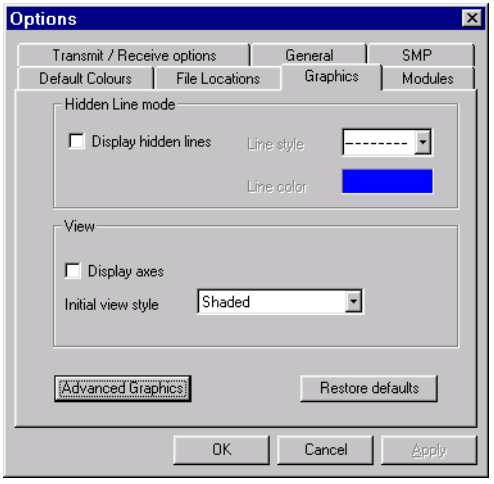

Figure 5–3 Graphics options

Click **Restore Defaults** to restore the default settings for each of the options on this tab.

Click **Advanced Graphics** to open the Advanced Graphics dialog, shown in Figure 5–4.

- The **Shaded mode** panel lets you control how facets are displayed in Shaded mode. You can display facets as shaded, wires, or points. Additionally, when viewing shaded facets, you can choose whether each facet should appear flat or smooth.
- The **Facet Strips** panel lets you control the output of facet strips in Shaded mode. If **Output facet strips** is turned on, then facet strips are output. If, in

addition, **Facet style** in the **Shaded mode** panel is set to Wire, you can control the appearance of facet strips in the document window:

- Click the **Strip color** to choose which color facet strips are displayed in.
- Turn on **Display strip outline only** if you just want to see the edge of each facet strip, but not the facet detail within each strip.

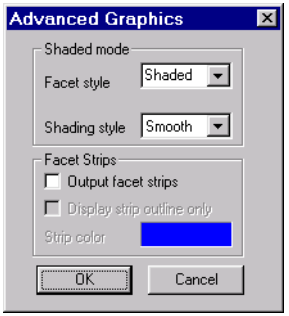

Figure 5–4 Advanced graphics options

5.5 Transmit and receive

The Transmit/Receive tab lets you specify transmit and receive options.

- Select the Parasolid version that you want to use for saving part files in the Transmit Options area.
- Specify whether to reduce assemblies to their constituent parts when opening documents in the Receive Options area.

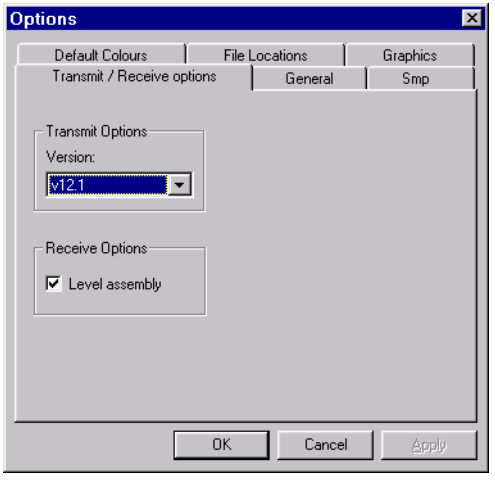

Figure 5–5 Transmit/receive options

5.6 Default file locations

The File Locations tab lets you specify default folders for schema, module and help Files. To change a default location, select it in the File Types list, click **Modify**, and browse to a new location in the dialog that opens.

To load PS/Workshop V1 modules automatically when starting PS/Workshop, put a tick in the check-box. See Section 6.1, “PS/Workshop V1 modules” for more details.

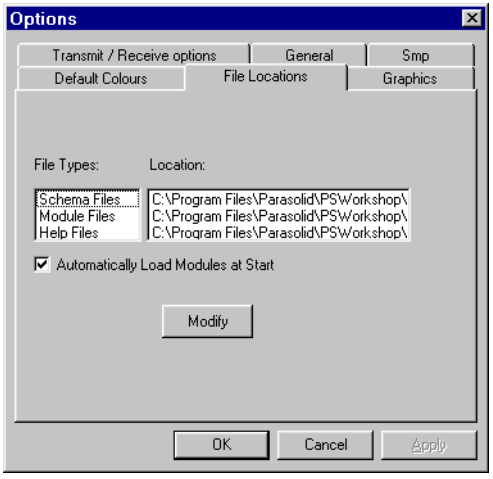

Figure 5–6 File location options

5.7 Symmetric multi-processing (SMP)

The SMP tab lets you turn Parasolid SMP on or off. If your computer only has a single processor, you can ignore this option.

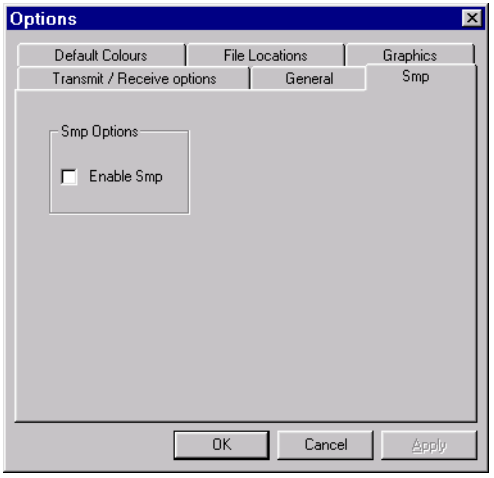

Figure 5–7 SMP options

5.8 Module loading

The Add-Ins tab provides control over which COM-based modules are currently loaded in PS/Workshop. It also lets you manually register or remove a COM-based module. COM-based modules can only be used with PS/Workshop V2 and above. See Section 6.2, “PS/Workshop V2 modules”

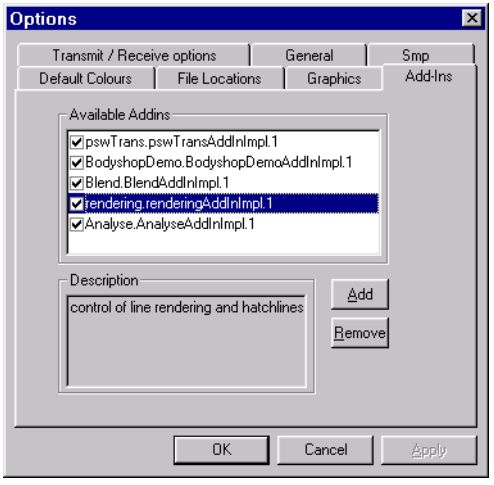

Figure 5–8 Module options

Note: This tab is only available if you choose **Tools > Options** when there are no documents open in PS/Workshop.

Loading Modules 6

This chapter explains how modules are loaded and managed in PS/Workshop to provide extra functionality. There are two types of module that can be loaded into PS/Workshop:

- Modules that were developed for use with PS/Workshop V1.
- COM-enabled modules that were developed for use with PS/Workshop V2 and above.

Both types of module are managed in different ways, as explained in the rest of this chapter.

Once a module has been loaded, a new item appears on the PS/Workshop menu bar that gives access to the functionality of the module.

For information on developing your own modules for use with PS/Workshop, see the *PS/Workshop Developer Guide*.

6.1 PS/Workshop V1 modules

Modules that were developed for use with PS/Workshop V1 are loaded using **File > Open**, as described in Section 2.2, “Opening and closing files”. Once a module has been successfully loaded, its functionality is available to any documents that you subsequently open, but will not be available to documents that were already open when the module was loaded.

You can load a V1 module automatically when PS/Workshop is started as follows:

- Place the DLL file for the module in PS/Workshop’s Modules folder (by default, this is the `Modules` folder in the PS/Workshop installation folder).
- In PS/Workshop, choose **Tools > Options** and click the File Locations tab.
- Make sure that the “Automatically Load Modules at Start” option is ticked.
- Click **OK** to dismiss the Options dialog.

You can also change the location of the Modules folder from the File Locations tab of the Options dialog. See Section 5.6, “Default file locations”, for details.

6.2 PS/Workshop V2 modules

Modules developed for use with PS/Workshop V2 and above use the COM interface provided by PS/Workshop. As such, they need to be registered on your computer before PS/Workshop can recognize them.

COM-based modules are managed using the Add-Ins tab of the PS/Workshop Options dialog. Choose **Tools > Options** to display this dialog.

This tab displays all the modules that are recognized by PS/Workshop. In order for a module to be recognized by PS/Workshop it needs to be registered on the computer.

Note: The Add-Ins tab of the Options dialog is only available if there are no documents open.

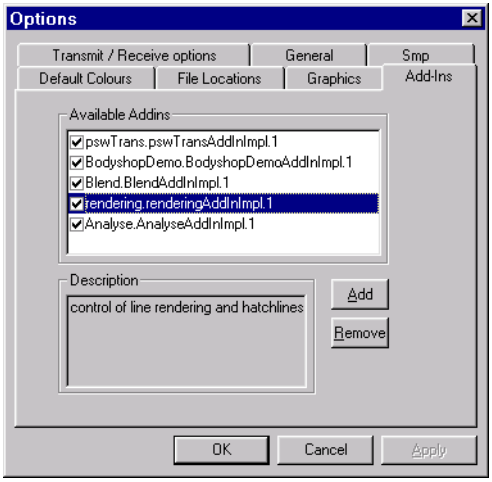

Figure 6–1 Managing COM-based modules

6.2.1 Registering V2 modules

Before a module is listed in the Available Add-Ins list of the Add-Ins tab, it must be registered. There are two ways of registering a V2 module:

- **Automatically.** Many V2 modules are registered automatically when they are installed. For instance, all the modules that are supplied with PS/Workshop itself are registered automatically.
- **Manually.** Sometimes, you may have a module that is not registered automatically (for example, if you are just given a single DLL file). To register

it manually, click **Add** in the Add-Ins tab of the Options dialog, and browse for the new module. After registering the module a new entry is added to the module list.

You may need to register a module manually if you decide you need to use a module having already removed it from the list of modules.

6.2.2 Loading and unloading V2 modules

You can dynamically load and unload V2 modules from the Add-Ins tab of the PS/Workshop Options dialog.

- To load a V2 module, place a tick next to the module name in the Available Add-Ins list of the Add-Ins tab, as shown in Figure 6–1.
- To unload a module, remove the tick from the module name. The module is still available for you to load without having to re-register it.

Modules that are ticked in the Available Add-Ins list are also loaded automatically when you start PS/Workshop.

6.2.3 Removing V2 modules

You can remove a V2 module permanently from the list of modules in the Add-Ins tab of the Options dialog as follows:

- Display the Add-Ins tab of the Options dialog.
- Select the module you want to remove.
- Click **Remove**.

Note: Removing the module from the list does not delete the module from the system - it only de-registers it so that it is no longer available to PS/Workshop.

If you need to add a module back into the list after removing it, you will need to re-register it manually, as described in Section 6.2.1, “Registering V2 modules”.

Known Issues 7

This chapter lists known issues with the current version of PS/Workshop.

PS/Workshop has been compiled, linked and tested on Windows NT version 4.0 with Service Pack 5. It is supported on versions of Windows NT 4.0 with Service Pack 3 and above.

It has been compiled using Microsoft Visual C++ version 6.0 with Service Pack 4. PS/Workshop has also been tested on Windows 2000, should also run on Windows 98 and Windows ME although it is not officially supported on these last two platforms.

On certain graphics cards in 256 color mode an open part may not display correctly. To correct this problem switch to a higher color mode and restart PS/Workshop.

Modules written for previous versions of PS/Workshop and linked to `edsps111.lib` will need to be recompiled and linked to `pskernel.lib` to load successfully