



HOME

User Manual

DELMIA Process Engineer[®]

Graphic Tools - Application



Foreword

This manual provides an introduction to the basic graphic tools operations and functions.

While developing these functions we have made every effort to create a clearly organized, easy-to-understand program structure.

A user-friendly interface as well as a clear menu guide will enable you to quickly learn how to operate the program and to get familiar with its functions so that you can carry out your planning tasks in a quick and reliable way.

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1. Introduction

This manual explains how to use the Process Engineer Graphic Tools for your planning purposes. The Graphic tools are used to create layouts for factory planning.

1.1 How to Use this Manual

This manual enables you to get familiar with the operation and functions of the basic settings. This manual briefly describes:

- Menus available for the graphic tools
- How to use graphic tools for editing graphics



Note

When handling the basic graphic tools functions, please remember that there is a general introduction to the Process Engineer in the Basic Manual.



Click [General Introduction](#) to access the manual

1.2 Documentation Conventions and Symbols

The symbols used in this manual are intended to provide you with keys to the contents in an immediately understandable manner.



This symbol is used to introduce key concepts that are covered in the sections immediately following this symbol. As a result, this symbol most frequently appears at the beginning of chapters or sections.



Note

*This symbol is used to mark notes, which provide you with additional information you need to have for further work. You will either find the Note sign at the beginning of a chapter or in a particular text passage in the chapter. Texts bearing this sign are additionally marked with **Note**. The text is always in italics.*




Caution

*This symbol indicates that the text that follows describes particular circumstances that you must avoid to avoid potential errors with the operation of the program or harm to data. You will either find the Caution sign at the beginning of a chapter or near a particular text passage in the chapter. Texts that are introduced by this sign are additionally marked with **Caution**. The text is always in italics.*

Example

This symbol marks examples which serve to illustrate a certain situation.

- 1) This symbol marks the individual operational steps involved in a particular operating instruction. Operating instructions describe operational steps, for example, how to open a menu or execute a function.
- This symbol marks listed subjects. The symbol for listed subjects can be either used to structure a continuous text or to list main subject keywords.
- This symbol marks list inside a bulleted or numbered list.
-  This symbol marks cross reference information that is available in another manual.

1.3 New Functions in Graphic Tools

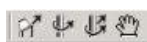
No new functionality has been added for this release.

1.4 Graphic Editing Icons

The graphic editing icons are arranged in the toolbar. The icons in the toolbar are only available if a graphic has been opened. They can be divided into two categories:



- Icons for representing views such as icons for different volume representations. Icons are available for representing two- and three-dimensional views.



- Icons for functions such as icons for rotating, translating or placing of graphic objects.



Icons are important for layout editing. Using icons, for example, you can quickly change between views or functions. Familiarise yourself with the icons. All icons are only available when you open a graphic in the **Edit graphic** mode.

At the same time you have a quick overview of the important functions in graphic editing. Nearly all icons are available in the graphic menu as well.

- 1) You can enable an icon by left-clicking on it. To restore the original mode, you have to disable the corresponding icon. To do this, click again on the activated icon.

1.4.1 Show Views



Open New View

Use this icon to open any number of graphic views e.g. to select another view or a setting for the same graphic while working. The new view has the same properties as the open view.



Solid Rendering Mode

Solid Rendering Mode

If this icon is enabled, the individual graphic objects can be displayed in full volume. In this view take a look at the external outline of the graphic objects, which are shown with surfaces. *Please refer to the [Figure 26](#).*



Wire Rendering Mode

Wire Rendering Mode

If this icon is enabled, you will see the outline of the individual parts of which a graphic object consists in this view. The graphic objects are shown without any surfaces. *Please refer to the [Figure 27](#).*



Solid and Wire Rendering Mode

Solid and Wire Rendering Mode

If this icon is enabled, the individual graphic objects can be displayed as full volume. In this view the outlines of the parts of a graphic object are particularly highlighted. As in the case of the purely volume view, the surfaces are visible with this kind of approach. *Please refer to the [Figure 28](#).*



Bbox Rendering Mode

Bbox Rendering Mode

If this icon is enabled, the individual graphic objects can be displayed transparently. In this view you can see the graphic objects as a cuboid model. The individual main parts are shown as a rendering curve corresponding to the shape of a component. In contrast to the wire rendering mode, this representation only shows the external edges of graphic object; no surfaces of graphic objects are visible. *Please refer to the [Figure 26](#).*

1.4.2 Zooming Views



3D Zoom

3D Zoom

If this icon is enabled, only parts of a graphic within a cubical volume are maximised using the three-dimensional zoom function. The centre of this volume is the centre of the maximised view. This means that when working with this tool, the camera is moved exactly around this centre when navigating in this view. *Please refer to the [Zoom Functions](#).*



2D Zoom

2D Zoom

If this icon is enabled, the 2D zoom function is available for 2D and 3D views. The centre can be calculated using the individual geometries available in this view.

Using the 2D zoom function, parts of a graphic within a rectangular surface are maximised. Use this function if, for example, you want to view several parts of an maximised part. *Please refer to the [Zoom Functions](#).*



Show All

Show All

If this symbol is enabled, all graphic objects of a graphic are shown again. Using the zoom function you have viewed a part of a graphic, for example, and now you want to view the complete graphic, then click this icon to show all graphic objects. *Please refer to the [Zoom Functions](#).*

1.4.3 Dimensioning Views



3D View

3D View

If this icon is enabled, the graphic is shown three-dimensional. *Please refer to the [Figure 20](#).*



Top View

Top View

If this icon is enabled, the graphic is shown two-dimensional. In this view the top view of a graphic object is shown. *Please refer to the [Figure 21](#).*



Front View

If this icon is enabled, the graphic is shown two-dimensional. In this view the front view of a graphic object is shown. *Please refer to the [Figure 22](#).*



Left Side View

If this icon is enabled, the graphic is shown two-dimensional. In this view the left side view of a graphic object is shown. *Please refer to the [Figure 23](#).*



Right Side View

If this icon is enabled, the graphic is shown two-dimensional. In this view the right side view of a graphic object is shown. *Please refer to the [Figure 24](#).*



Back View

If this icon is enabled, the graphic is shown two-dimensional. In this view the back view of a graphic object is shown. *Please refer to the [Figure 25](#).*

1.4.4 Executing Functions for Graphic Editing

Dialogs are available for most of the functions you will use in working with graphics. When opening a dialog for the first time, it will appear in the center of the graphic.

You can move these dialogs within the graphic. Whenever the dialog is opened later, it will appear where it was last placed.

In some dialogs, for example those for measuring, moving, or rotating objects, the last editing state is shown when the dialog is re-opened; you can use this to edit further objects.



Save View Settings

If this icon is enabled, different settings of a graphic are saved. You can set, for example, the viewing angle of a graphic. Bear in mind your camera, for example, if you want to use it for recording. *Please refer to the [Saving View Settings](#).*



Export

If this icon is enabled, you can start a dialog, where graphic files with different formats can be exported. *Please refer to the [Figure 1](#).*



Further more information, *Please refer to the [System Library Manual](#).*



Figure 1: Graphic Export Dialog



Open Color Dialog

If this icon is enabled, you can change the color of an selected object. You can get to this dialog using the **Graphic** menu and the **context menu**. *Please refer to the [Figure 2](#) and [Apply Object Color](#).*



For more information, *Please refer to the [Settings Manual](#).*

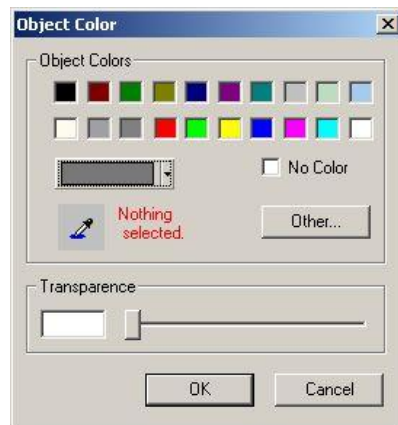


Figure 2: Selecting an Object Color for a Selected Object

1.4.4.1 Editing Annotation Sets

An annotation set can be set user-specific. Three functions are available for editing annotation sets:



Length

If this icon is enabled, you can determine the length of an annotation set for a graphic object. An annotation set needs to be activated first. *Please refer to the [Annotation Sets and Annotation](#).*



Angle

If this icon is enabled, you can determine the measurement angle in an annotation set. An annotation set needs to be activated first. *Please refer to the [Annotation Sets and Annotation](#).*



Edit Text

If this icon is enabled, you can determine the text of an annotation set for a graphic object. An annotation set needs to be activated first. *Please refer to the [Annotation Sets and Annotation](#).*

1.4.5 Moving, Measuring and Placing Graphic Objects



Note

If you move objects in the graphic, e.g. when moving or rotating objects, it is possible that you will not see the movement after saving and re-opening the graphic, especially when moving. Switch to the 2D view, e.g. top view; there you can always see how the objects were moved.



Measurement

If this icon is enabled, you can start the measuring functions dialog. Using the measuring tools, objects and routes in a graphic can be measured. *Please refer to the [Measurement Function](#).*



Translate

If this icon is enabled, you can start the translating tool dialog. You can move graphic objects in the absolute and relative coordinate system. *Please refer to the [Translate Function](#).*



Rotate

If this icon is enabled, you can start the rotating tool dialog. You can rotate graphic objects in the absolute and relative coordinate system. *Please refer to the [Rotate Function](#).*



Coordinates

Coordinates

If this icon is enabled, you can start the coordinates tool dialog. Use the coordinates function to change an object's coordinates. *Please refer to the [Coordinates Function](#).*



Placement

Placement

If this icon is enabled, you can start the dialog for placing graphic objects. *Please refer to the [Placement Function](#).*



Lasso (Multiple Selection)

Lasso (Multiple Selection)

If this icon is enabled, you can select graphic symbols. *Please refer to the [Lasso Function](#).*

2. Overview

The graphic tools are used to edit a layout created, for example, for a factory planning using the Manufacturing Concept. A layout with graphic objects is opened using the **Edit graphic** context entry in the resource view; graphic objects can only be edited in this mode. A graphic cannot be edited in the **Show graphic** mode. For editing purposes you can use keyboard commands, a graphic and context menu and the icons in the toolbar.

Using graphic tools, for example, graphic objects can be rotated, moved, or placed exactly. Most of the functions available for editing a graphic can be started using the icons in the toolbar or using the context menu. Graphic objects are resources such as machines for manufacturing parts, workplaces for mounting subassemblies or transport tools and installations, for example, for storing products or materials. The resource structures are usually created in the resource structure of the PPR Navigator. These are assigned corresponding system items from the system library used to show graphic objects. During layout editing, for example, resource properties can be edited or new resources can be inserted into the layout.

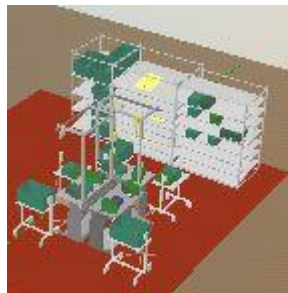


Figure 3: Representation in the Layout of a Graphic

The resources of a graphic can be shown two- or three-dimensional. For the display of graphic objects you can choose between a volume or a transparent view to get a quick overview of the most important graphic objects. For quick and simple editing of single graphic objects it is possible to create graphic groups that can be undone again if necessary. In addition graphic objects can be dimensioned and marked. Using the two- or three-dimensional zoom function every screen part can be shown individually. Enable the navigation tools with the menu or use the keyboard commands for quick editing. Using the **Create new BOM** function you can create new bills of materials from selected objects.

2.1 Graphic Settings

In Version PE 5.12, the current settings of open graphics can be changed. Changes to the settings are temporary, and they are no longer effective after the graphic is closed. The principal settings for the graphic are defined in the global settings (**Tools < Settings < Change**).



For more information on graphic settings, *Please refer to the chapter The Graphics Tab* [Settings Manual](#).



- 1) Select **Graphic - Graphic settings** in the menu to open the graphic settings.
- 2) You can temporarily change settings for the open graphic under the four tabs in the Graphic settings dialog.

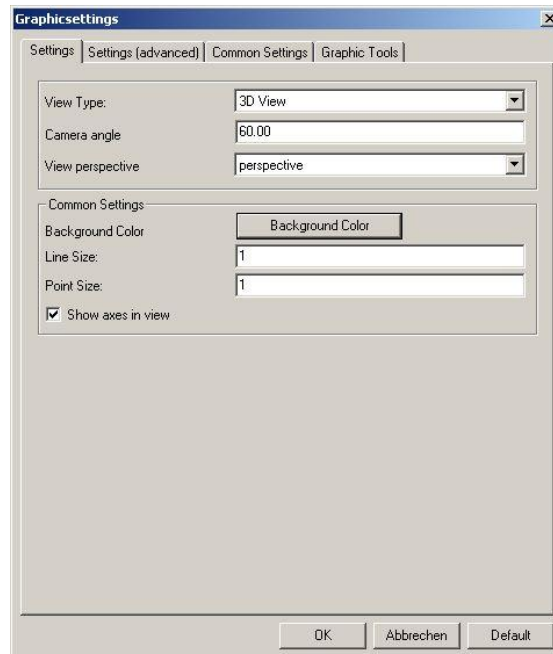


Figure 4: Opening the Graphic Settings Dialog – Temporarily Edit

2.2 Zoom Functions

Using the zoom functions, sections in a graphic can be maximized or minimized.

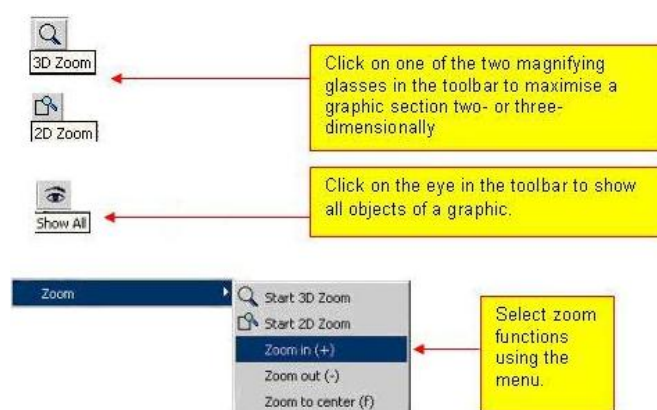


Figure 5: Zoom Functions

To use Zoom Functions in the Graphic:

- 1) Enable the zoom functions by either using the toolbar or the menu.
- 2) The cursor will assume the shape of a magnifying glass.

- 3) Use the magnifying glass to mark the area that should be maximised by drawing a rectangle while holding down the left mouse button. This view will be maximised. To close the magnifying-glass-function, click again on the magnifying glass.
- 4) Sections can be maximized or minimized step by step using the keyboard; the magnifying-glass-function does not have to be enabled. You can minimize sections by typing **Z**; you can maximize sections holding down the shift key.

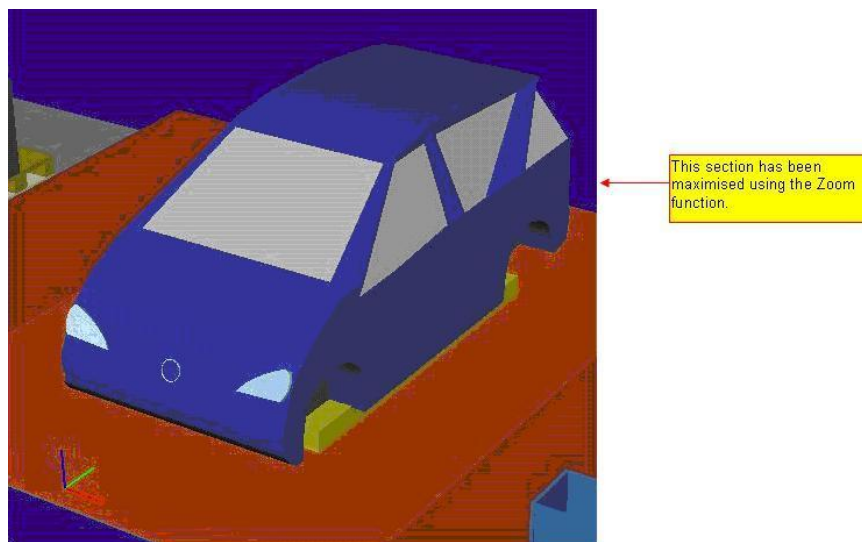


Figure 6: Maximized Section

“Zoom to Center“ Zoom Function

Zooming selected objects of a graphic to the center; after you have selected and maximized objects of a graphic, for example, use this function to get to the center of the selected objects.

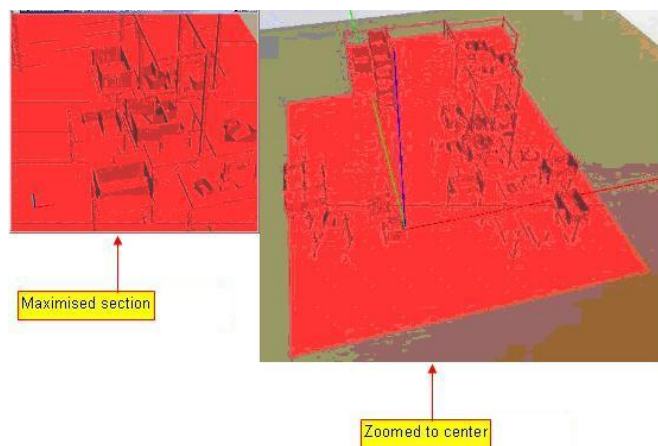


Figure 7: “Zoom to Center“ Zoom Function

Maximize and Minimize Zoom Function

These two zoom functions are only available, if one of the zoom functions (2D or 3D) have been executed. Using this two functions you can move in both directions in the whole zoomed area. The functions can also be executed using the **Plus** or **Minus** keys on the keyboard.

2.2.1 3D and 2D Zoom Functions



Using the 3D zoom, function parts of a graphic within a cubical volume are maximized. The centre of this volume is the centre of the maximized view. This means that when working with this tool, the camera is moved exactly around this zoomed centre when navigating in this view.



The 2D zoom function is available for 2D and 3D views. The centre can be calculated using the individual geometries available in this view.

- 1) When zooming, the section to be maximized will be marked with a red cuboid. Only the section within the cuboid will be maximized.

Example

Example
of a 3D
zoom

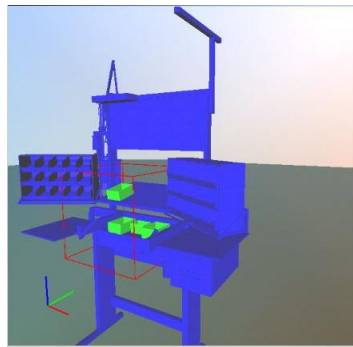


Figure 8: Applying 3D Zoom Function

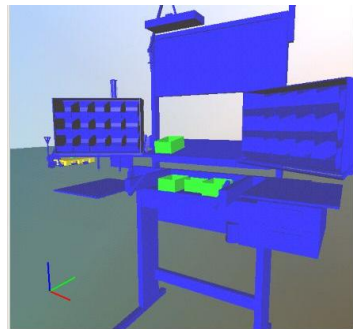


Figure 9: 3D Zoom Function – Maximised Section

2.2.2 Apply Object Color

You can transfer the color of one object directly to another object. In order to do this, use the **Object Color** dialog and the pipette.

The procedure is demonstrated by an example with two objects. The object color of the yellow pyramid is to be applied to the blue sphere.

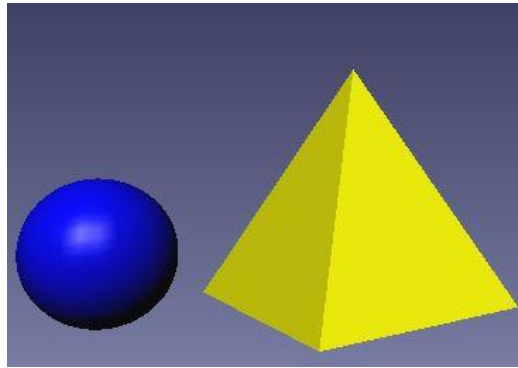


Figure 10: Initial Situation – Two Objects with Different Colors

- 1) First select the object whose color you want to change in the graphics window.

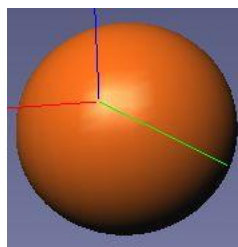


Figure 11: Select Blue Sphere

- 2) Open the **Object Color** dialog. Click the icon in the toolbar.
- 3) Select the type of pipette.

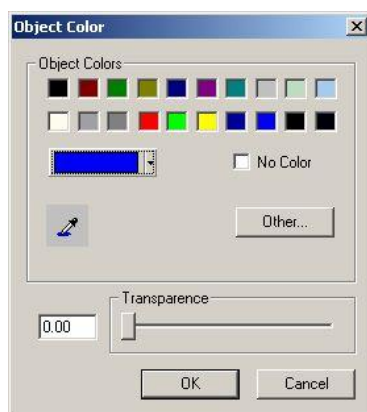


Figure 12: Open Dialog – Select Pipette



- 4) With the pipette, click the object whose color you want to use. In the example it is the pyramid. The new color is shown in the dialog after the selection.

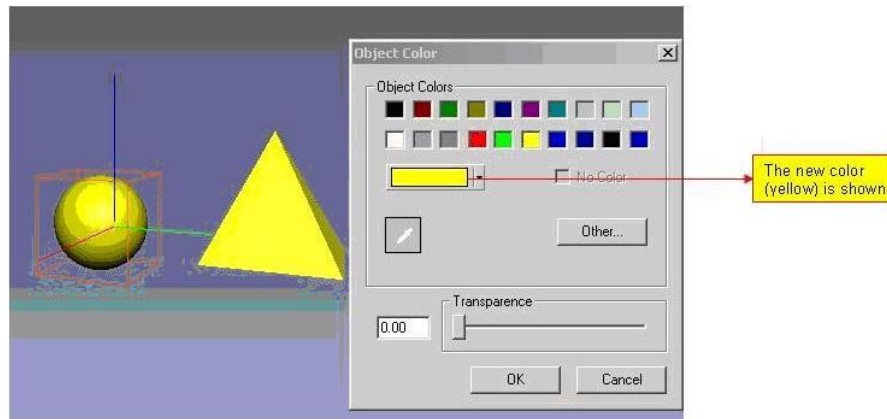


Figure 13: Select Object with Pipette

5) Confirm the selection with **OK**. Both objects now have the same color.

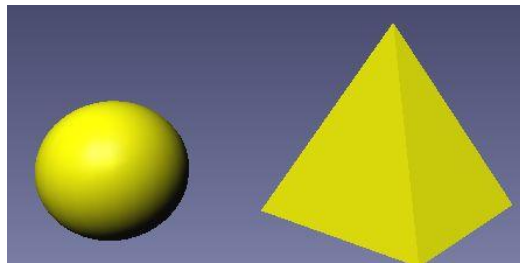


Figure 14: Object Color Applied Directly

2.3 Graphic with Stereo Effect

To be able to view 3D graphics with stereo effect your hardware should be equipped with stereo-capable equipment (graphics card, monitor). Stereo hardware essentially consists of a corresponding monitor, a stereo-capable graphics card and shutter glasses.

Viewing Stereo Graphics Ergonomically

In principle you can view a 3D graphic with stereo effect in two different ways:

- **Using simple red-green stereo glasses:** This view does not require stereo-capable hardware. When using these glasses, the stereo effect is created by a red-green stereo image (anaglyph). However, in this view the colour information of the graphic objects is lost. All graphic objects are shown in black and white. For a longer view this view is not recommended: firstly due to the missing colour information and secondly due to the fact that this mode strains the eyes very much.
- **Using shutter glasses:** With shutter glasses all graphic objects of a 3D display are shown in accordance with their object colour during stereo view. This method causes considerably less strain on the eyes, but requires stereo-capable hardware.

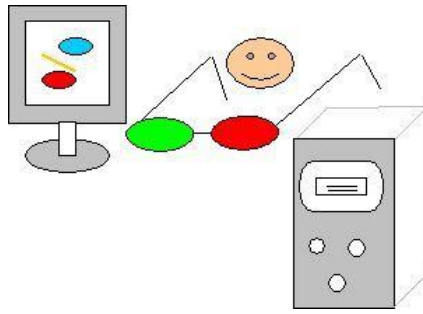


Figure 15: Schematic Display Stereo View

Activating the Stereo Mode

If you want to activate the stereo mode the graphic objects of the graphic are displayed twice. The double view of the graphic objects is the requirement for the three-dimensional spatial effect to occur during the stereo view of the graphic. The stereo effect is achieved by a change of images between the two lenses of the glasses at a frequency of 60 images per second.



Note

Always ensure that the stereo mode is activated in the driver of the graphics card. When viewing for a longer period of time, you should take a short break at least every 30 minutes to relax your eyes.

- 1) Open, for example, a graphic using the **Show graphic** or the **Edit graphic** context functions.
- 2) Select the **Stereo (s)** menu item from the graphic menu. *Please refer to the [Figure 16](#).*

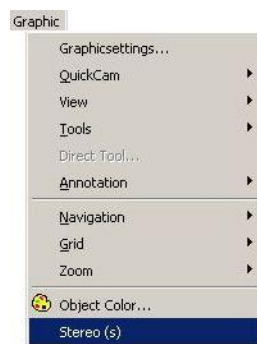


Figure 16: Select Stereo (s) Menu Item

- 3) After opening the graphic in the stereo mode, the single graphic objects are shown twice. You can also activate the stereo mode using the keyboard. Press the **S key**.
- 4) Now just one thing is left to do: Put your glasses on, the stereo effect can be seen immediately.

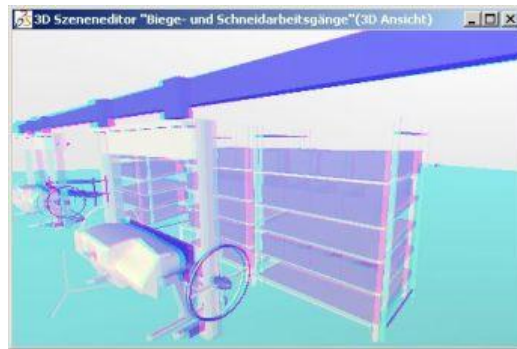
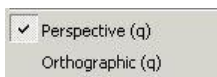


Figure 17: 3D Graphic Opened in Stereo Mode; the View is Shown Twice

2.4 Show Views



Selecting Perspective or Orthographic Settings

Use the **Perspective** and **Orthographic** settings to specify the object view; this can be compared to setting a camera lens. **Perspective** corresponds to the wide-angle lens of a camera and **Orthographic** corresponds to the focus (object zoom).

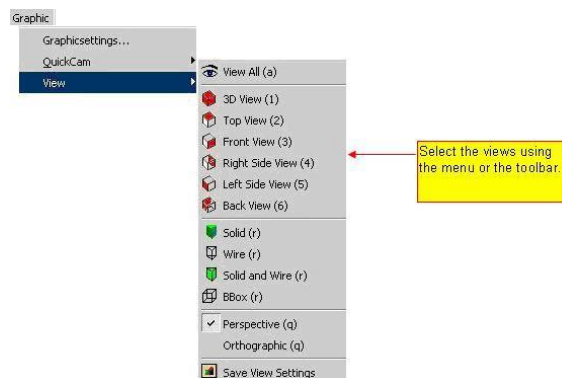


Figure 18: Show Views Graphic

2.4.1 2D and 3D Views

Use the icons to quickly change views. *Please refer to the [Graphic Editing Icons](#).*

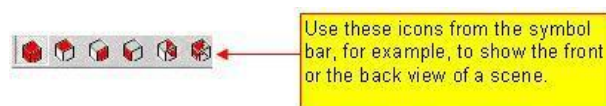


Figure 19: Graphic Editing Views

To Select Views:

- 1) Select views by either using the toolbar or the menu.
- 2) Click **View** icon.

3D view

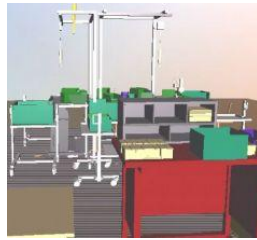


Figure 20: Example: Workplace in 3D



Figure 21: Example: Workplace, Top View

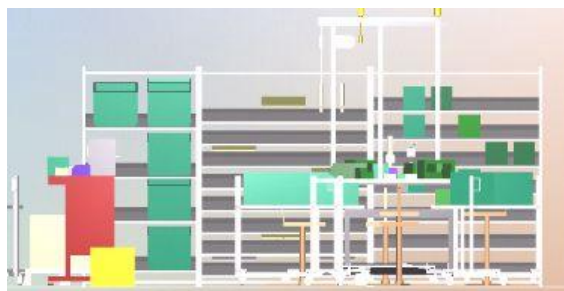


Figure 22: Example: Workplace, Front View

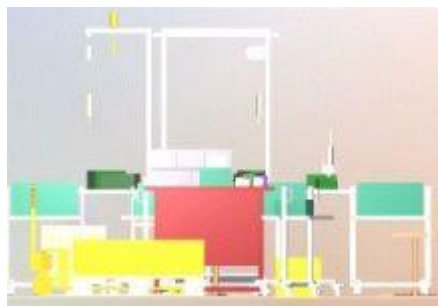


Figure 23: Example: Workplace, Left Side View

Right Side View



Figure 24: Example: Workplace, Right Side View



Figure 25: Example: Workplace, Back View

2.4.2 3D Displays of Graphic Views



Using these symbols the way is chosen, how a graphic is to be displayed. In contrast to the views for 2D and 3D displays where the view at a graphic is displayed, for example, as side or front view. *Please refer to the [Graphic Editing Icons](#).*

Left-click an icon to enable an icon.

Example

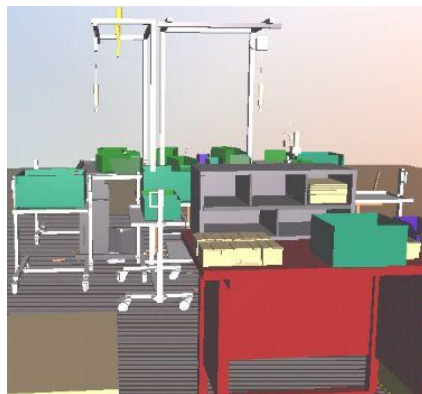


Figure 26: Example: Workplace, Solid Rendering Mode

Wire Rendering Mode



Wire Rendering Mode

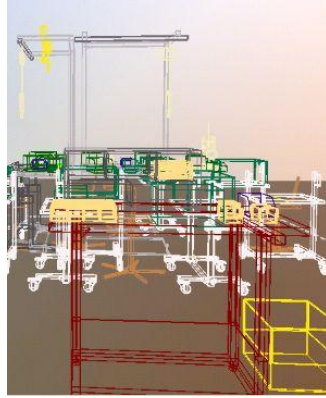


Figure 27: Example: Workplace WIRE RENDERING MODE, only Edges Visible

Solid and Wire Rendering Mode

Example



Solid and Wire Rendering Mode

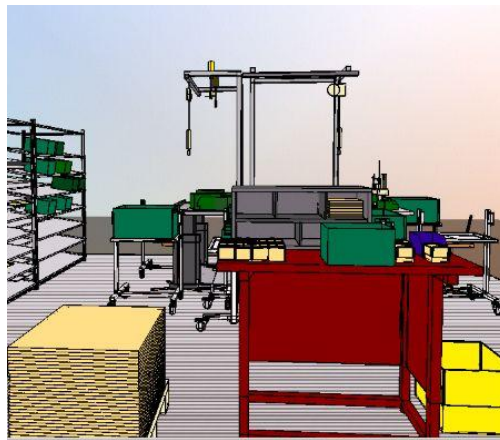


Figure 28: Example: Workplace Solid and Wire Rendering Mode, Surfaces and Edges Visible

Example



BBox Rendering Mode

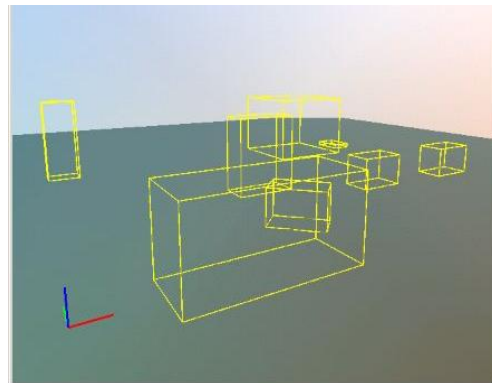


Figure 29: Example: Workplace Display as a Bounding Box

2.5 Navigation Menu

The navigation menu offers several modes used to set the viewing angle for a graphic object. You could also compare the selected mode with a camera position moved around a graphic. With all three modes the graphic remains

unchanged, i.e. the objects change their position among themselves, however, the position with regard to the coordinate source remains unchanged.



Figure 30: Navigation Graphic

2.5.1 Examine Mode

In this mode you can use the arrow keys or the left mouse button. In doing so you will lead the camera around the centre of the graphic. Have a globe in mind, the position of the terrestrial globe remains unchanged. You can capture every angle with the camera, i.e. longitudes as well as latitudes. If you have selected one of the two-dimensional views, this mode is not available.

- 1) To move the cursor in this mode, hold down the left mouse button and move the cursor around the graphic or use the four arrow keys.
- 2) To change between the Walk and the Examine mode click letter “W” on the keyboard. You can also select the mode using the menu.

2.5.2 Walk Mode

In this mode you can use the arrow keys or the left mouse button. The camera is moved; it can be moved in a horizontal direction to the left and to the right or in a vertical direction into the graphic or out of the graphic.

Pan Function

Using this function you can use the left mouse button or the arrow keys while holding down the shift key at the same time. The camera is positioned so that the centre of the graphic is moved synchronously to the cursor. Click the shift key, hold it down and press the left mouse button. In this position you can move horizontally or vertically in the graphic. This function is available in both modes.

■ Examine as Frame Sequence Mode

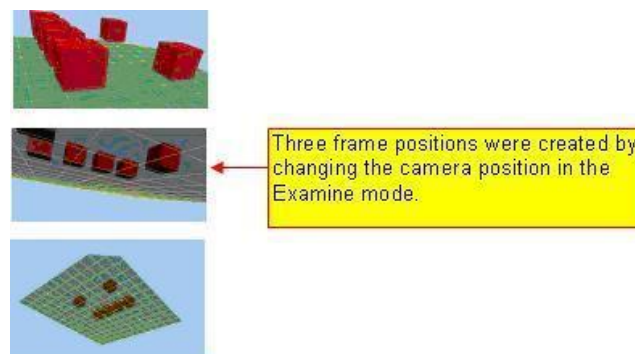


Figure 31: Three Variations of the Camera Position with the Examine Mode

■ Walk as Frame Sequence Mode

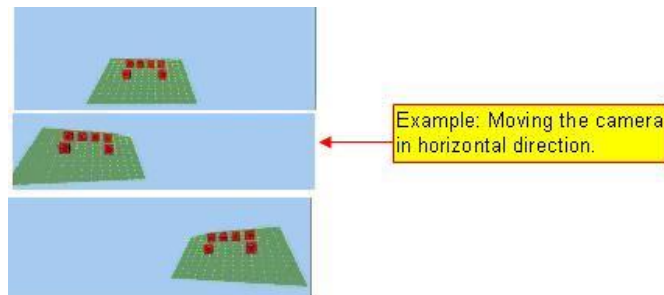


Figure 32: Example: Camera Movement in Horizontal Direction

2.5.3 Bounding Box Function

The bounding box function is enabled, if while moving a graphic only the edges (Please refer to the [Figure 29](#)) of the individual graphic objects should be visible. After moving the graphic, the graphic is shown again in its original display.

2.6 Tools Menu

A layout is created using a graphic object. Using the graphic objects (machines, belts, workplaces, or transport tools) in the layout, workplaces, and production processes are displayed, for example, which are arranged in a planned order in the layout. To do this it is necessary, for example, to measure the graphic objects and to place them exactly.

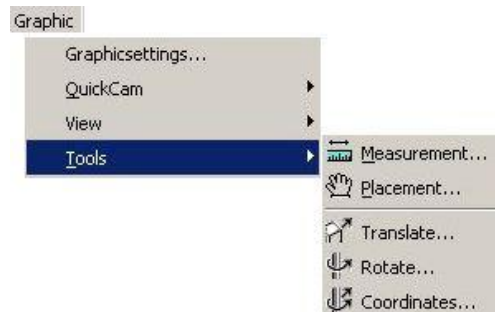


Figure 33: Tools Menu

2.6.1 Measurement Function

Using the measurement function, routes and bodies are measured. For the measurement of bodies and routes points, edges and surfaces are used. The measurement tool is used to measure:

- Width of a transport route
- Distance between two bodies

Measuring Distances and Routes

You can call the measurement function either using the menu or the appropriate icon in the toolbar. Please refer to the [Figure 33](#).



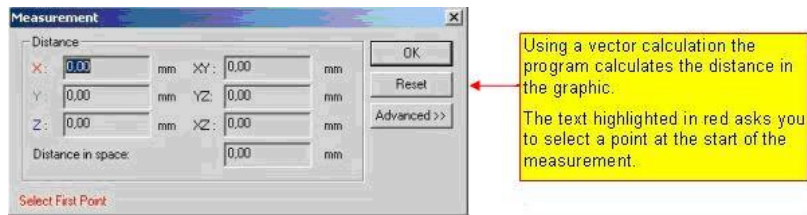


Figure 34: Measurement Dialog

2.6.1.1 Measuring Width of a Supporting Shelf

Measuring the width of a supporting shelf in top view and the distance between workplace and supporting shelf in 3D view. Please refer to the [Figure 35](#) and [Figure 36](#).

- 1) Call the dialog box.
- 2) The cursor assumes the form of cross hairs. You have to determine a starting and end point.
- 3) Set two successive measuring points.
- 4) Click, for example, on two points in an object. Two measuring points of the supporting shelf are used in the example.



Note

To measure bodies or distances always proceed in the same way. It does not matter whether you measure a distance with two points, edges or surfaces. You always have to select measuring points and click them successively. You can either measure between two bodies or just measure one body.

Example

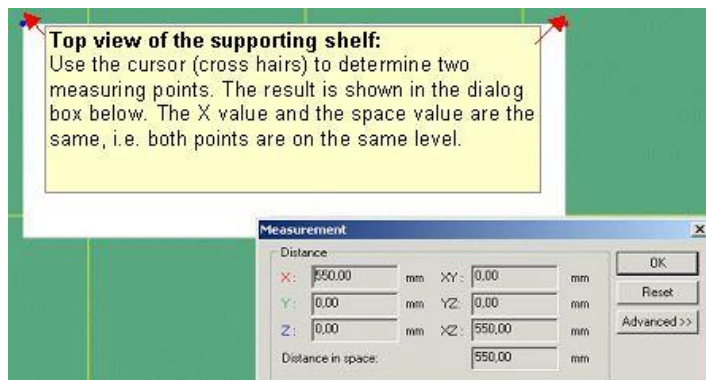


Figure 35: Results of the Measurement of a Supporting Shelf in Top View

Example

- 5) You have already measured the width of the supporting shelf and have changed to the three-dimensional view. Measuring points are set in order to measure the distance between workplace and shelf.
- 6) The objects are not in the same line (level).
- 7) In the translate dialog, you can correct the (X,Y,Z) values.

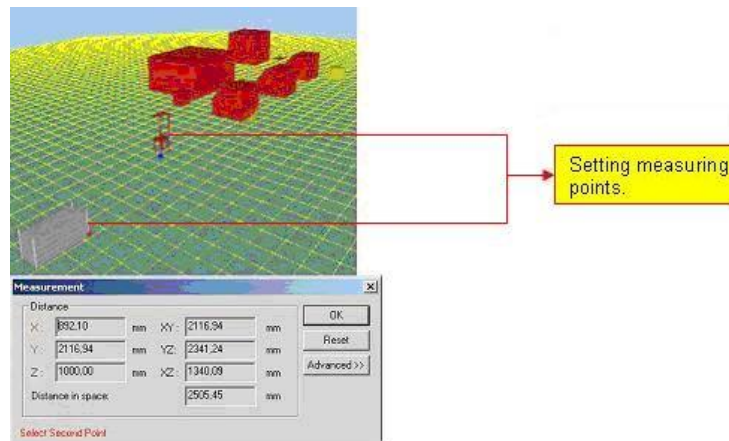


Figure 36: Calculating the Distance between Workplace and Shelf

2.6.1.2 Copying Measuring Values

Using the Copy function (right mouse button) you can copy single measuring values of axes values and insert them at another place.

Note

You can only copy one axes value at a time. It is not possible to copy multiple values at the same time.

In the example an X value of an selected object is copied, which is then available for further editing.

To Copy the X-Axis Value

- 1) Select the value in the X-axis field and press the right mouse button.
- 2) Click **Copy**, the value is saved to the clipboard.
- 3) Using **Paste** you can insert a copied value at another place.

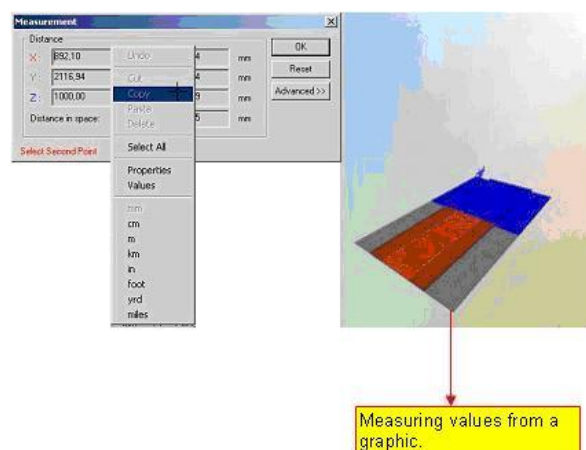


Figure 37: Copying Values

2.6.1.3 Advanced Measurement Dialog

In the advanced dialog the distance between two measuring points is measured; whereby a point, an edge, or a surface can be selected as the second measuring point. In the advanced dialog the absolute coordinates of the **X-, Y-, and Z-**axes are shown.

- 1) Click **Advanced** in the **Measurement** dialog.

Advanced >>

Reset

- 2) Using **Reset** all values are set to zero.
- 3) In the present example an X-value is calculated between two measuring points on an edge.
- 4) In the distance field the value **X** = 1000.00 mm is shown.
- 5) The advanced dialog shows the absolute coordinates.

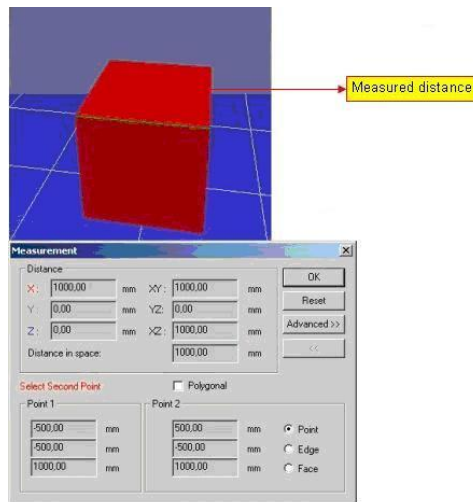


Figure 38: Advanced Measuring Functions

2.6.1.4 Polygonal Measuring

A distance is defined by a starting and end point. If you measure several distance sections consecutively, i.e. continually reset the starting and end point, activate the field **Polygonal**.

<<

You can go back a step by using the double arrow button.

Set the starting and end point as usual for the first distance section when measuring multiple distance sections. In the next step you would set the end point for the second distance section.

The end point of the first distance section is thus the starting point of the second distance section. The measured values of the individual distance sections are shown in the dialog accordingly.

In this way you can measure several distances consecutively.

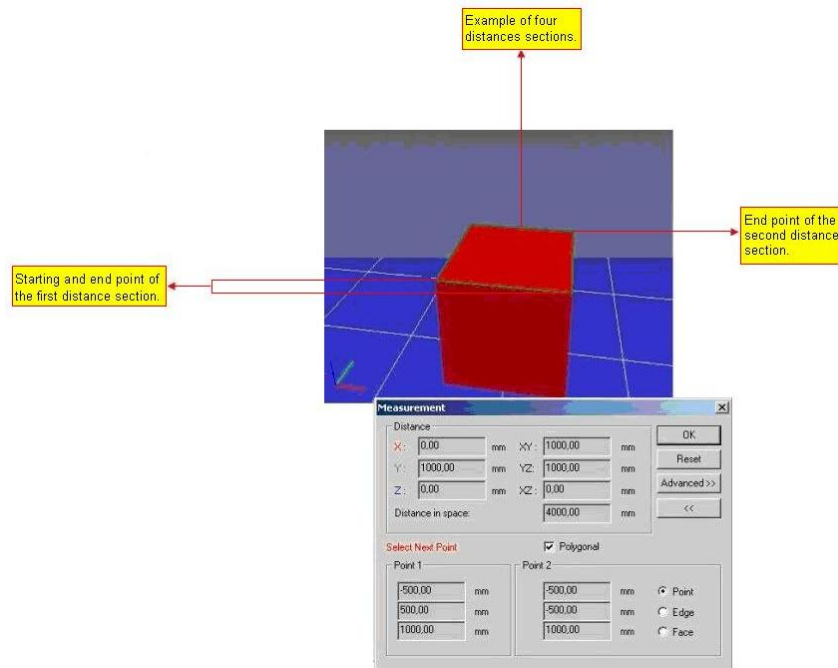


Figure 39: Distance Sections with Polygonal Measuring

2.6.2 Placement Function

Using the placement function bodies and surfaces are placed.



Note

If you want to place an object on another body or another surface, you first have to select the body. You can select a body by left-clicking on it. You can select multiple bodies by holding down the Ctrl key until all bodies (objects) are selected. This menu item can also be called using the right mouse button.



To place a body onto a surface, open the dialog either using the icon in the toolbar or using the **Tools** menu of the right mouse button **context menu**. Please refer to the [Figure 33](#).

Placement Dialog

An object can be placed using the **body to face** or the **point to point** functions. The procedure is the same for both functions.

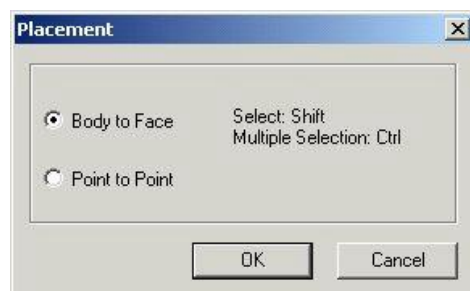


Figure 40: Placement Dialog

Placing an Object

Three steps are necessary to place an object:

- 1) Step 1: Select crate.

Example

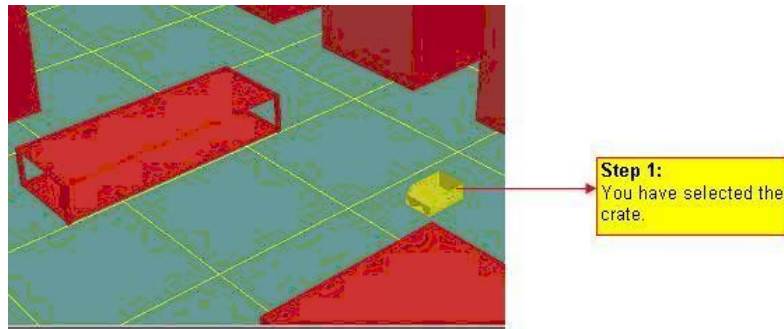


Figure 41: Select Crate

- 2) Step 2 and 3: Put the crate on shelf.
- 3) Open **Placement** dialog. In this example the **body to face** function has been selected.
- 4) Click shelf, the crate is placed.

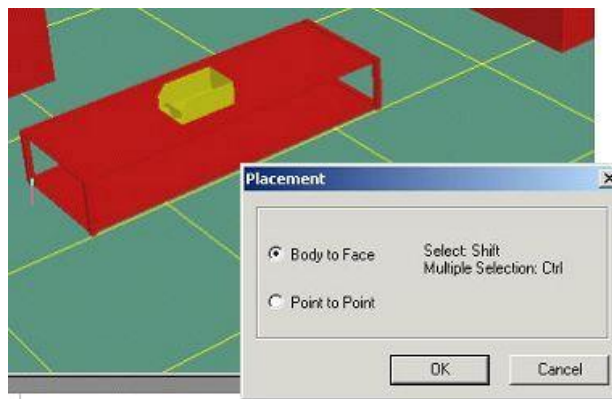


Figure 42: Procedure when Placing Objects

Example

In this example the crate is put on the shelf in the same way.

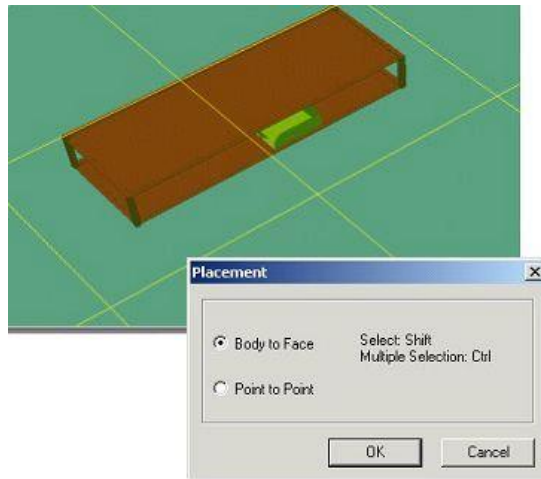


Figure 43: Putting the Crate on the Shelf using the Placement Function

2.6.3 Translate Function

Using the Translate function, objects can be translated into a graphic. Graphic objects can be moved in the **absolute** as well as in the **relative** mode. In the absolute mode, objects are moved in the so called global coordinate system (coordinate system of the open graphic) and in relative mode in the local coordinate system of a selected graphic object. Please refer to the [Figure 47](#).



Note

The functions for translating in dialog are only available if a graphic object has been selected.

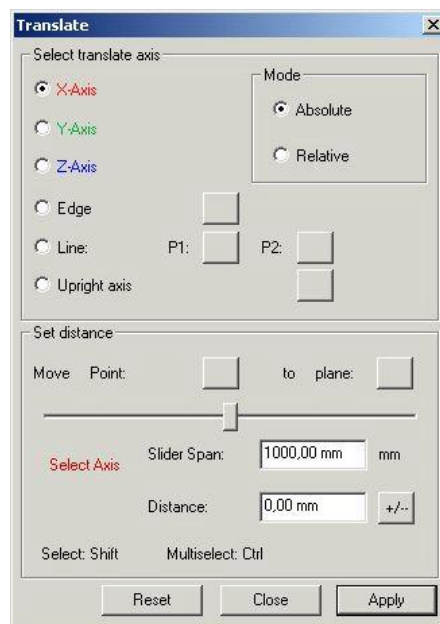


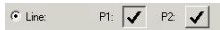
Figure 44: Dialog for Translating Graphic Objects

2.6.3.1 Using Buttons for Translating Actions

The use of buttons when translating

When executing translating actions the buttons are enabled.

Determine the translating route using two points: The two points in line used for the translating route can be set at the selected graphic object or



outside the selection. It is better to select the graphic object to be translated before starting the translating process.

- After making the selection, click **Line** field under **Select translate axis** in the dialog (*Please refer to the [Figure 44](#)*). Now you can set the two points one after the other. The checkmark next to **P1** and **P2** indicates that the two points have been set successfully. The cursor will assume the shape of a circle and can be used to set a point.
- **Determine the translating route on an edge:** After making the selection, click **Edge** field under **Select translate axis** in the dialog. The edge must be set on a graphic object. With this function you can set the edge on a selected graphic object or outside the selection on the graphic object.
- **Determine the translating route on an upright axis:** After making the selection, click the **Upright axis** field under **Select translate axis** in the dialog. The upright axis can be set on a selected body and outside the selection.
- Use this button to change the signs for the value in the **Distance** dialog (*Please refer to the [Figure 44](#)*); the translating is performed in accordance with the selected sign. Always enter the value in this field by which a graphic object is to be translated.

2.6.3.2 Translating Graphic Objects



- 1) Select a graphic object. You can open the **Translate** dialog either using the **Graphic** menu (*Please refer to the [Figure 33](#)*), the right mouse button context menu or the Icon in the toolbar. *Please refer to the [Figure 44](#)*.
- 2) For the Translate function in the direction of the three **Z-, X-, Y-**axes you can select between the absolute and the relative coordinate system.
- 3) A function must always be selected under **Select translate axis** before executing the translating action for the **Move point to plane** function. For the three functions (**X-, Y-, and Z-**axes) you can select again between the absolute and the relative coordinate system when translating.
- 4) In the slider span you can set the maximum translate value for the slider; in the example the slider span is set to 1,000 mm, thus, the graphic object can be directly translated using the slider by 500 mm to the left and by 500 mm to the right. The value for the slider span can be as large as you like. Use the context menu to change the measuring unit.
- 5) Use the shift and Ctrl keys to select graphic objects. Whereby using the Ctrl keys multiple graphic objects can be selected at once. Selecting: Hold down one of the keys and select the object using the cursor.
- 6) Press **Apply** to execute the translating action once.
- 7) If you select the relative coordinate system, the graphic object is translated along its own coordinates. *Please refer to the [Figure 45](#), [Figure 46](#), and [Figure 47](#)*.



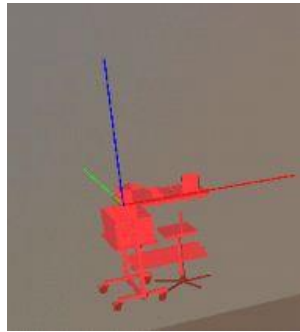


Figure 45: Example for a Coordinate System: Selected Graphic Object

- 8) If the absolute coordinate system is selected, the graphic object is translated in the coordinate system of the graphic.



Figure 46: Example for a Coordinate System: Graphic

Example

Schematic display of absolute and relative coordinate systems.

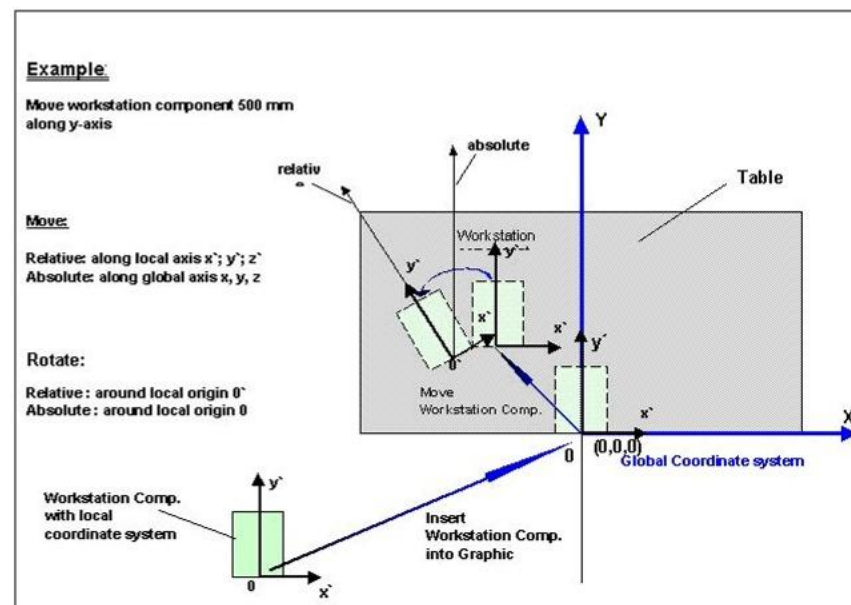


Figure 47: Example for Coordinates: Absolute/Relative

2.6.3.3 Translating Graphic Object

Example

Graphic objects can be translated according to the criteria listed under **Select translate axis**. (Please refer to the [Figure 44](#)) The following examples have been used to explain the translating procedure.

Translating in X-, Y-, Z-Axes

Getting familiar
with the trans-
lating functions

Apply

Reset

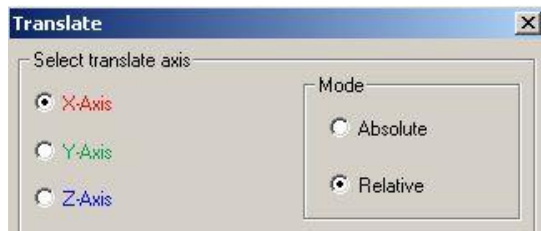


Figure 48: Selecting Axes and Mode

- 1) Select one of the three axes where you wish to translate the graphic object to (in the example the **X-axis** is used). Afterwards, select the mode for the coordinate system (in the example the **relative mode** is used).
- 2) Enter a value in the **Distance** field, by which the graphic object is translated to (in the example the value **minus 500** is used).
- 3) Afterwards, click **Apply**. The graphic object is translated by the value entered in the selected axis (in the example the **X-axis** is used).
- 4) Using **Reset** you can reset the **Distance** value to zero. Press the **Close** button to close the dialog. *Please refer to the [Figure 49](#).*

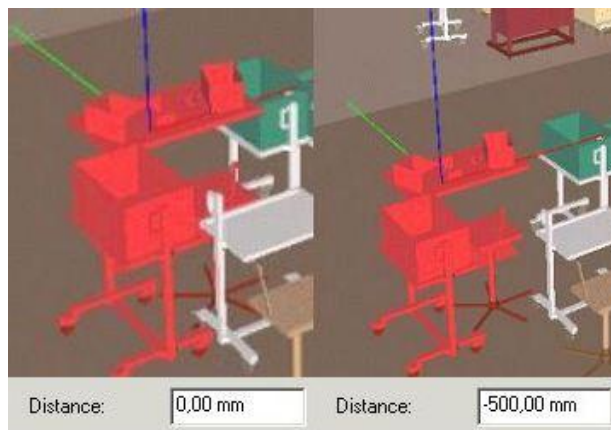


Figure 49: Example: Translating X-Axis, Relative Coordinate System

Example

Getting familiar
with the trans-
lating functions

Translating Graphic Object in Edge, Line and Upright Axis

The basic procedure for determining the distance you want to use to translate a graphic object is the same for all applications regardless of whether you use an edge, two points or the upright axis. The two modes of absolute and relative are not available for these three possibilities; the translate direction is determined directly.

- 1) Select one of the three translating options (in the example **Line** is selected); the translate direction is thereby determined using two points. *Please refer to the [Figure 50](#).*

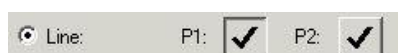


Figure 50: Checkmarks: both Points are Set

Distance: 432.50 mm +/-

- 2) Set the two points one after the other. The direction in which the graphic object should be translated is then determined. In the Distance field the measured length of the distance between the two points is shown. This value can be changed (in the example the value has been changed to 500mm).



- 3) Click **Apply**; the graphic object is translated. Press **Close** button to close the dialog. *Please refer to the [Figure 51](#).*

Example

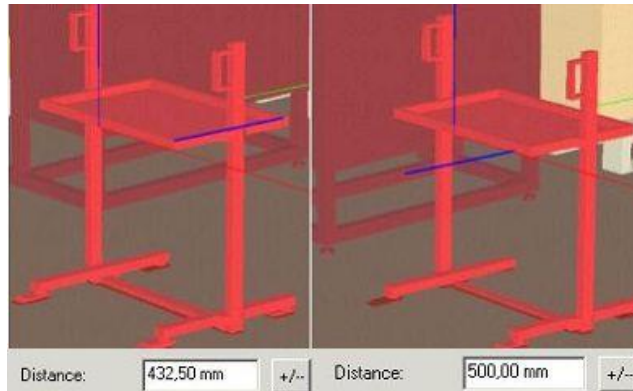


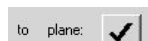
Figure 51: Example: Translating a Line with Two Points on the Graphic Object

Example

Move Point to Plane

Use the **Move point to plane** function if a graphic object is to be placed exactly onto the surface of another graphic object. This prevents two graphic objects from colliding. One of the three axes (X, Y, Z) must first be selected to execute this function.

Getting familiar
with the translating
functions



- 1) Select one of the three axes. Afterwards, click the *Move point* field and set the first point on the selected object.
- 2) After setting the first point, click the **to plane** field and set the second point on a surface where the graphic object is to be placed. In the **Distance** field the calculated distance is shown (in the example a graphic object (red crate) is placed directly in front of a shelf). The color in the picture shows the level of the selected surface.
- 3) Click **Apply** to place the graphic object. *Please refer to the [Figure 52](#).*

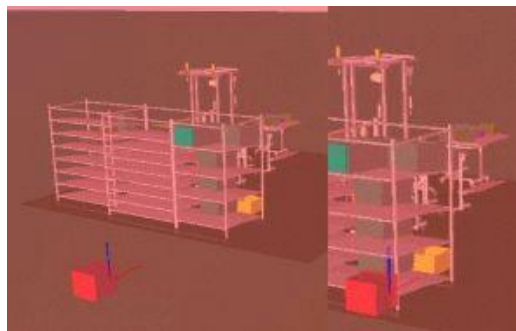


Figure 52: Example: Moving Point to Plane

2.6.4 Rotate Function

You can rotate graphic objects in the absolute and relative coordinate system. The same procedure used for translating graphic objects (*Please refer to the [Translate Function](#)*) also applies to the functions listed under **Select rotate axis**.



In this chapter several examples show the procedure for the two functions **Three points** (*Please refer to the [2.6.4.1 Three-Point Rotate Function](#)*) and **Set rotate angle** (*Please refer to the [2.6.4.2 Set Rotate Angle Function](#)*).

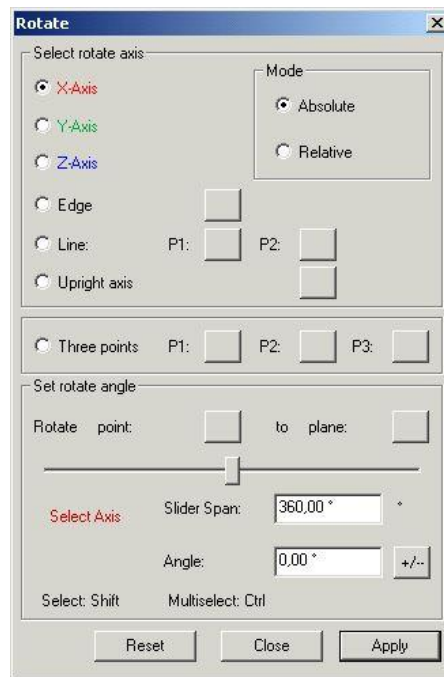


Figure 53: New Dialog for Rotating Objects

Example

Rotating in the absolute mode

Please refer to the [Using Buttons for Translating Actions](#).

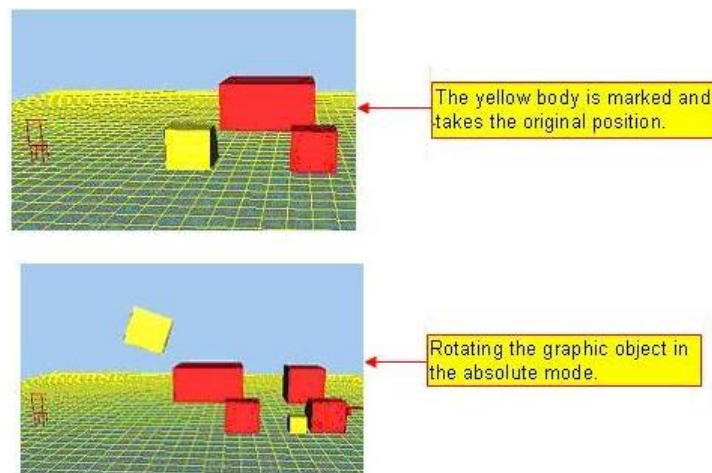


Figure 54: Example: Rotating in Absolute Mode along One of the Axes

2.6.4.1 Three-Point Rotate Function

Use the three-point rotating function to rotate and exactly position the graphic objects. The following example will explain this procedure:

- 1) By setting point 1 (P1), you can specify which point is to be rotated. This means: P1 is to be rotated in the direction of the second object.
- 2) By setting point 2 (P2), you can specify which point is to be used as the rotation point.
- 3) By setting point 3 (P3), you can specify the direction in which the object is to be rotated. In the example below, you could position the point along the entire edge.

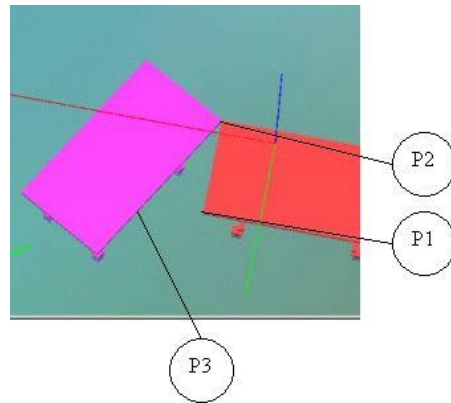


Figure 55: Setting 1: before Rotation

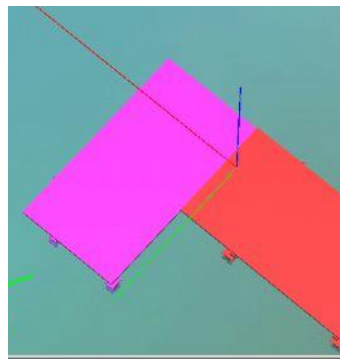


Figure 56: Setting 2: after Rotation

2.6.4.2 Set Rotate Angle Function

The **rotate angle** function is helpful if you want, for example, to set an object via a defined rotation angle at the source object in relation to a specific plane of the target object – this means that there must be specified values for the rotation axis and the rotation point for the body to be rotated, if you want the body to rest on the surface of another body. All rotation axes required are available for this purpose (*Please refer to the [Figure 53](#)*). You can choose between an absolute and a relative mode for each rotation axis (X, Y, and Z).

In the examples below, the Z-axis rotation angle has been set in the absolute mode. Relative mode is the preferred mode if the source object is close to the target object.

To activate the two buttons – **Rotate point** and **to plane** (*Please refer to the [Figure 57](#)*), you must first select them before executing the rotation using the following order: First set the rotation point at the source object. Then select the surface of the target object. Only select one plane for the target object.



Figure 57: Setting two Buttons for the Rotation Angle

Example 1

In this example, the rotation angle (green color) is set at the cuboid on the Z-axis. The target level is to be set at the second cuboid. The rotation angle and target level are marked by the two levels at the source and target objects.

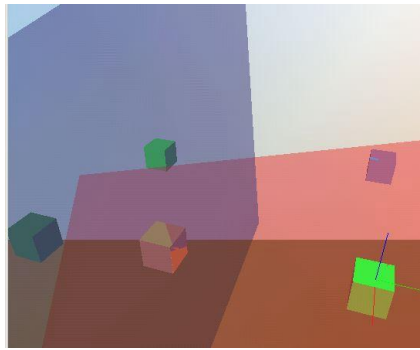


Figure 58: Example 1: Rotate Original Situation

Example

- 1) Click **Apply** after selecting the rotation angle and the target level (*Please refer to the [Figure 53](#)*). Press **Close** button to close the **Rotate** dialog. Thus, the marked levels will no longer be visible. The result will be shown in [Figure 59](#).

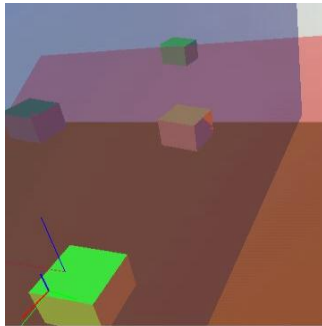


Figure 59: Example 1 – Rotate Result

Example 2

In this example, a lift truck and a machine are placed on the same level. The picture shows the entire process – from the original situation to the result.

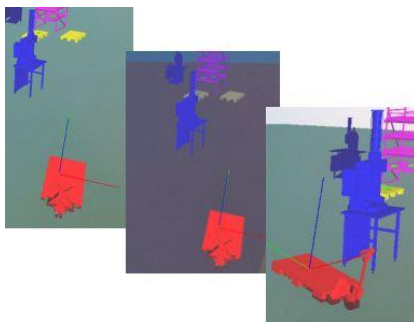


Figure 60: Example 2: Process from the Original Situation to the Result

2.6.5 Coordinates Function

Use the coordinates function (*Please refer to the [Figure 33](#)*) to change an object's coordinates. You can set the coordinates either when translating or rotating objects; **T** is the abbreviation for transformation and **R** stands for rotation.

You can change the coordinates in two ways:



- 1) Either enter the new values directly in the fields of the corresponding level.
OR
Select a second object using the tool and transfer the coordinates of this object.
- 2) Only those coordinates of the second object will be transferred for which the corresponding Checkbox is enabled in the dialog. Click the Checkbox to transfer the values of the second object.

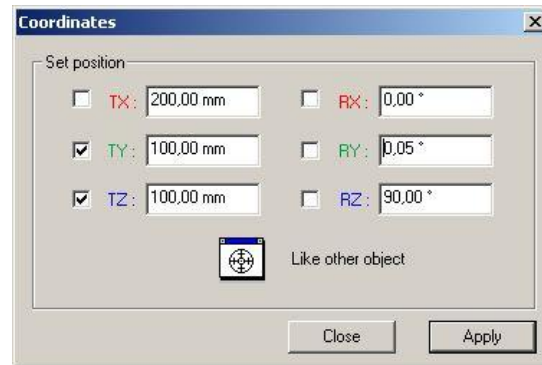


Figure 61: Coordinates Dialog

2.7 Direct Tool Function

Press the left mouse button while **holding down the Ctrl key** to freely move selected objects in the graphic. Use the **Direct tool** function to focus the movement. The direct tool function offers four options:

- 1) You can move an object along the X-axis. To do this, click field next to **X-axis**. *Please refer to the [Figure 62](#).*
- 2) You can move an object along the Y-axis. To do this, click field next to **Y-axis**.
- 3) You can move an object along the Z-axis. To do this, click field next to **Z-axis**.
- 4) Use the two direct tools. Use these two tools to create two points – the starting point and the end point – between both of which the axis is to be created. The object is then to be moved along this potential axis.



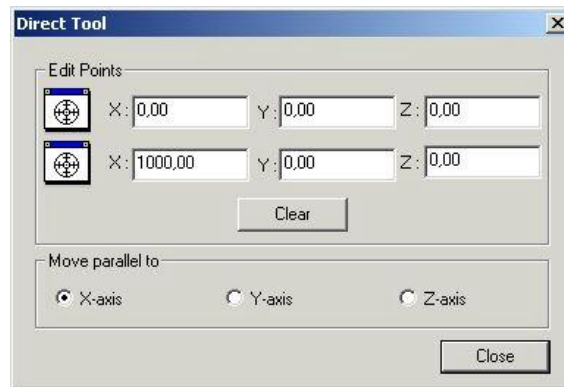


Figure 62: Direct Tool Dialog

Example

Example for the use of the **Direct tool** function. An object is moved along the X-axis. The yellow line on both pictures shows the course of the X-axis, along which objects are moved. Please refer to the [Figure 63](#).

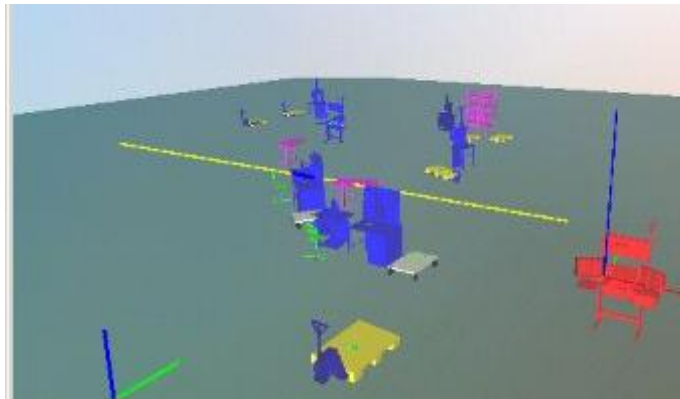


Figure 63: Moving along the X-axis: Original Situation

Example

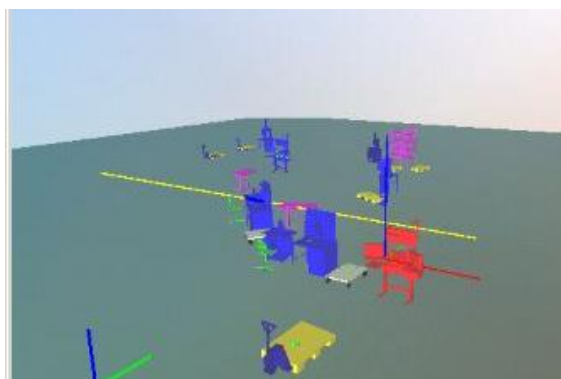


Figure 64: Moving along the X-Axis: Result

2.8 Specifying Objects in a Graphic

Use the **Split/Select next** and **Merge** functions to reposition or specify single objects within a graphic object. The connection to the graphic object will remain unaffected.

Use the **Graphic** menu to call both functions. Both functions will be disabled unless a graphic object is selected in the graphic.



Note

The display of individual graphic objects in an open graphic is dependent on the split depth specified during the configuration. The split depth determines up to what object level the graphic is resolved.

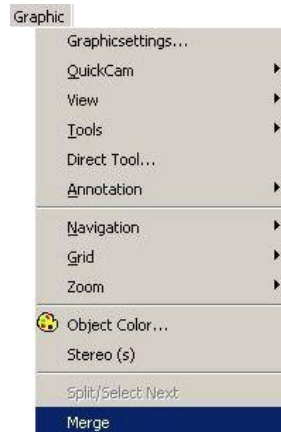


Figure 65: Split/Select Next and Merge Functions in the Graphic Menu

Split/Select Next and Merge Functions

- 1) Select the graphic object to reposition a single object from a graphic object.
- 2) After making the selection, click **Split/Select next** in the Graphic menu. You can select and reposition each object from the graphic object in the open graphic object.

Example

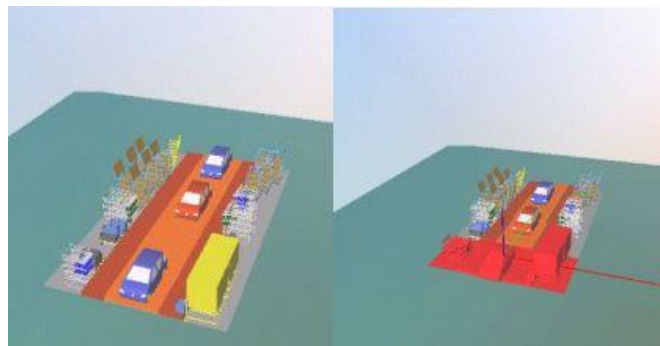


Figure 66: Select Graphic Object



Note

To move a selected object within a graphic, you have to hold down the Ctrl key while moving the object with the left mouse button. A graphic consists of system items. A graphic can only be split up to the system item level.

- 3) Select the object in the graphic object which you want to reposition. Move the object to the new position.
- 4) After repositioning the object, click **Merge** in the graphic menu to specify the new position of the object in the graphic object. After finishing this process, there is a selected display of the graphic object.
- 5) Left-click in the empty graphic to undo the selection. *Please refer to the [Figure 67](#).*

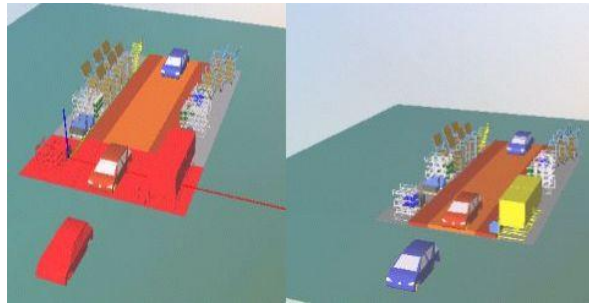
Example

Figure 67: Repositioning two Objects from two Graphic Objects

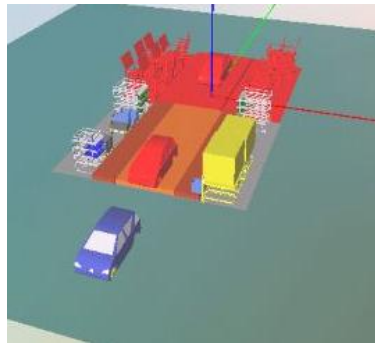
Example

Figure 68: Connection to the Second Graphic Object

2.9 Changing Assignment Function

With the **Change assignment** function, you can reassign objects within the existing hierarchical structures. A change of structure can only be traced in the bill of materials. *Please refer to the [Figure 69](#)*. There are two ways to change an assignment:

- [Insert a new object into the structure](#)
- [Reassign an existing object in the bill of materials structure](#)

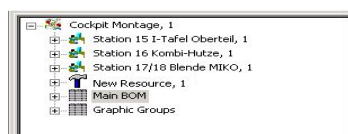


Figure 69: Structure of the Entire System

2.9.1 Inserting a New Object into the Structure

To execute a new assignment, you first have to select an object in the graphic. You can assign objects using the **Graphic** menu (*Please refer to the [Figure 65](#)*) or the right mouse button context menu (*Please refer to the [Figure 70](#)*).

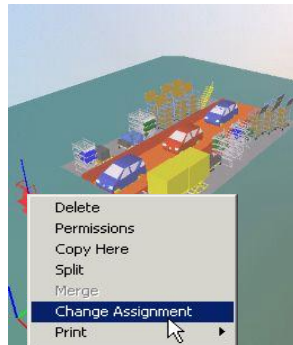


Figure 70: Change Assignment Context Menu

To Add a New Object



Note

To view a new object in the system graphic, you have to assign a graphic to the new object (system item). You can then insert this graphic into the system graphic.

The aim is to add a new object (resource) to the structure of the cockpit assembly. In the example it is the **machine test**. Please refer to the [Figure 73](#).

- 1) Select an object in the graphic.
- 2) Click **Change assignment** (menu or context menu). The **Change assignment** dialog opens.
- 3) Click **New** button. Another dialog opens. Select the plantype (station) for the new object.

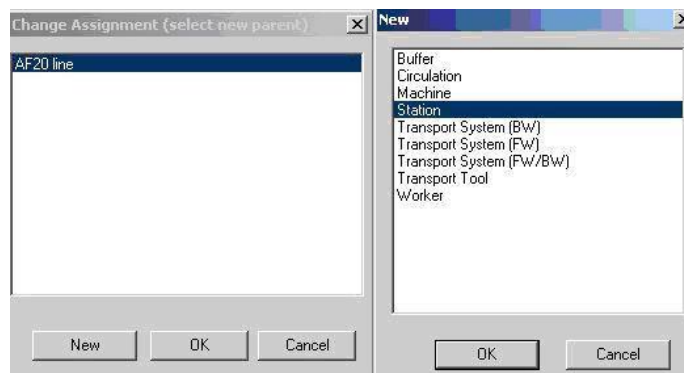


Figure 71 Change Assignment Dialog – New Object

- 4) Click **OK** button after you have made your selection. The **Properties** menu of the station opens. You can enter the specific data in this **Properties** menu. Please refer to the [Figure 72](#).

Confirm your specific entries in the Properties menu with "**OK**". The added object will be added to the selected bill of materials (in the screenshot below it is the highest system/cockpit assembly structure level). Please refer to the [Figure 73](#).

Example

If the graphic was created using a Manufacturing Concept, the new object will also be inserted into the Manufacturing Concept. Please refer to the [Figure 74](#).

Figure 72: Properties Menu for the New Object

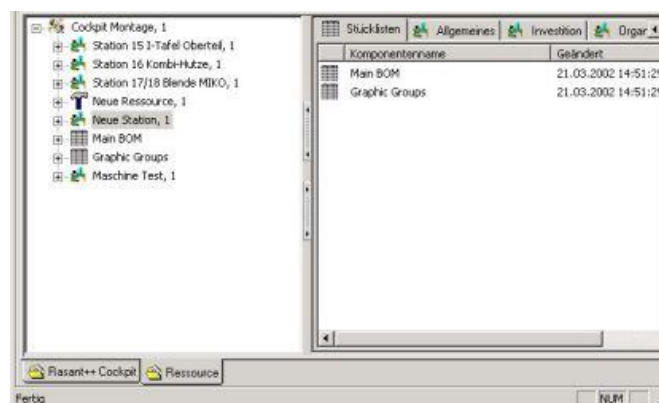


Figure 73: Object in the Bill of Materials: Machine Test

Example

New object in the Manufacturing Concept

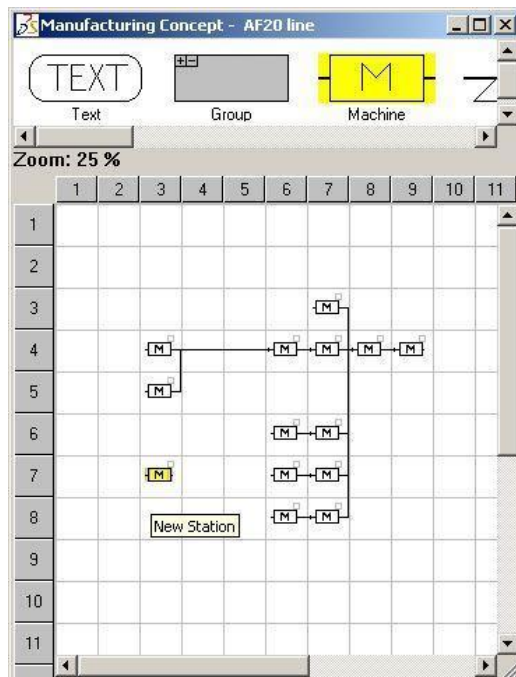


Figure 74: Manufacturing Concept with Newly Added Object

2.9.2 Reassigning an Existing Object

- 1) You have to select the object in the graphic to change the assignment of an existing object. *Please refer to the [Figure 70](#).*

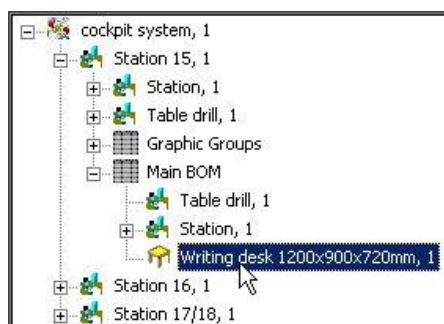


Figure 75: Original Situation: Assignment Display Working Table in Station 15

Example

The original situation and the aim in the cockpit system a working table system is assigned to **station 15**.

The aim is: This working table system is to be assigned to **station 17/18** using the **Change assignment** function.

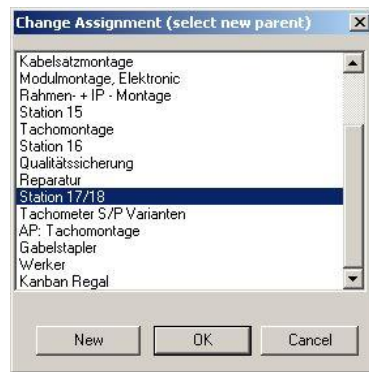


Figure 76: Selecting the New Structure in the Dialog

Example

- 2) After you have clicked **Change assignment** (Please refer to the [Figure 70](#)), select the new structure level in the open dialog (in the screenshot it is the station 17/18). Confirm the selection with **OK**. Please refer to the [Figure 76](#).
- 3) The new structure is assigned to the object. The old position in the graphic remains unaffected. Please refer to the [Figure 77](#).

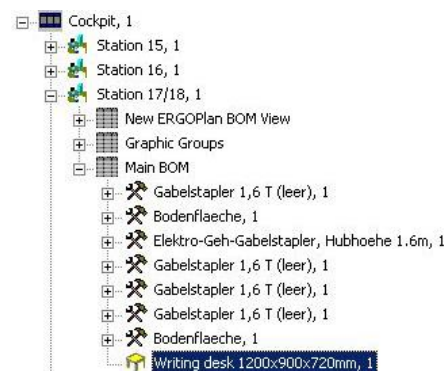


Figure 77: Aim - Splay Working Table in Station 17/18

2.10 Creating Graphic Groups

Graphic groups are created to execute graphic operations for the objects combined in the graphic group: for example rotating or translating objects. The created graphic groups can easily be saved permanently in a database. The created graphic groups are displayed in the bill of materials structure of a project under "Graphic groups". There you can edit these groups.

To create a graphic group, select at least two different objects for the group



Note

There is a restriction as far as the creation of graphic groups is concerned. An object which is already part of a graphic group cannot be assigned to another graphic group at the same time.

A message will inform you of this before the graphic group can be created and assigned to the bill of materials.



Figure 78: Message: Object is already a Member of another Graphic Group

2.10.1 Creating a New Graphic Group

- 1) Select the number of objects you want to include in a graphic group.
Please refer to the [Figure 79](#).

Example

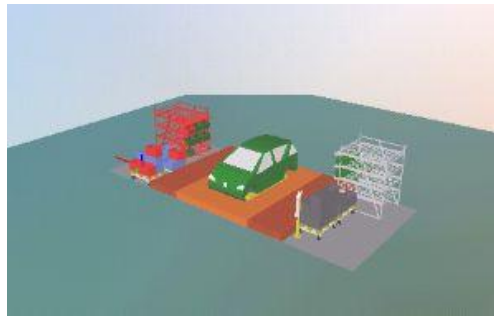


Figure 79: Selection of Objects: Selection Color: Red

- 2) Click **Create graphic group**. This menu item is called in the **context menu** or in the **Graphic** menu. *Please refer to the [Figure 80](#).*

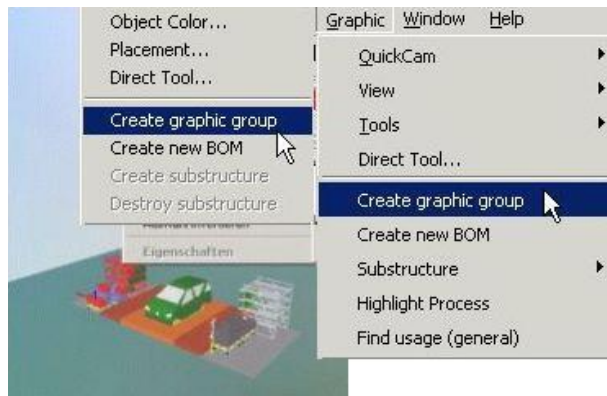


Figure 80: Creating Graphic Group: Context and Graphic Menu

Example

- 3) You can specify the new graphic group in the open properties dialog.
Please refer to the [Figure 81](#).

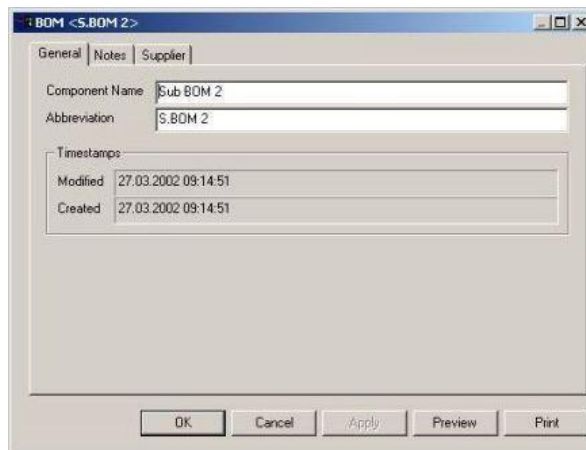


Figure 81: Graphic Group Properties Dialog

- 4) Confirm the entries with **OK**. The result will be shown in the structure:
Please refer to the [Figure 82](#).

Graphic groups are always displayed under **Graphic groups** in the structure. It is also possible to delete graphic groups there. Please refer to the [Figure 82](#).

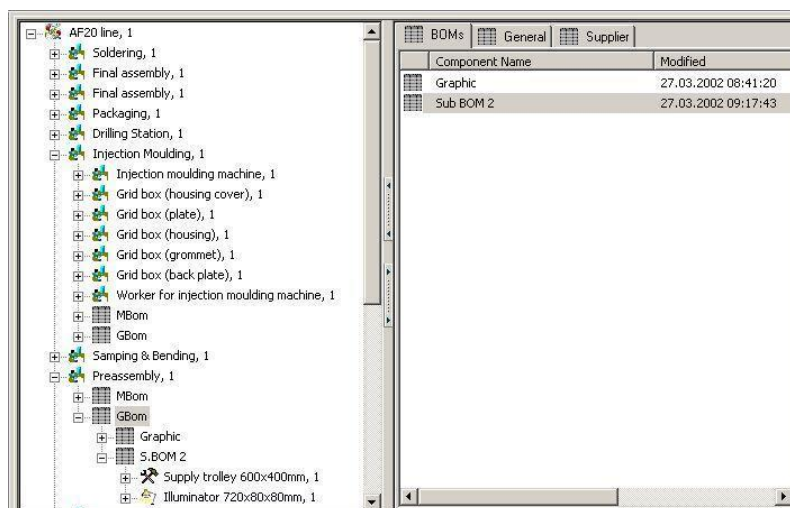


Figure 82: New Graphic Group: Displayed in the Bill of Materials

2.10.2 Working with Graphic Groups

You can use the entire range of graphic tools to edit a graphic group. The objects or the graphic group can be selected in the right display window. Thus, you can edit the objects of a graphic group or the entire graphic group. Please refer to the [Figure 83](#).

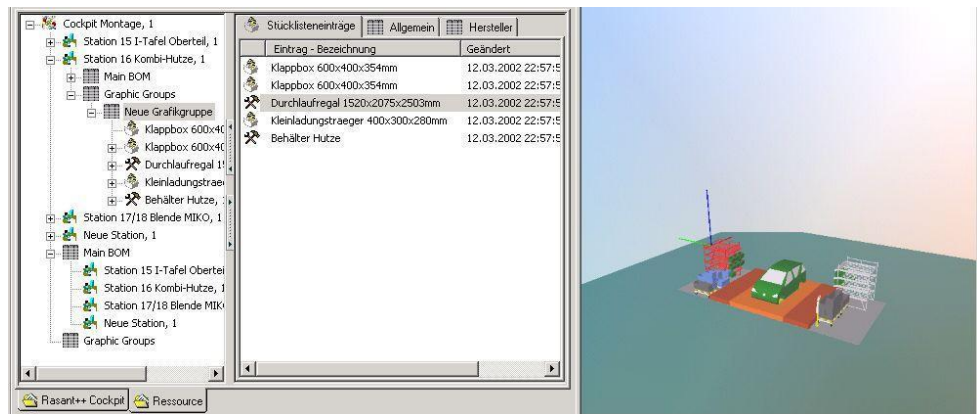


Figure 83: Edit Graphic Group: Selected Object

Editing Objects in the Graphic Group

To display each single object in a graphic group in the window on the right, select the graphic group (in the screenshot, it is the New graphic group) under **Graphic Groups** in the bill of materials structure (left window). Select the object you want to edit in the right display window. The selected object (in the screenshot it is the live storage rack) will be displayed in the selection color and can be edited (*Please refer to the [Figure 83](#)*).

In this example, the selected live storage rack (single objects of the graphic group) of the graphic group is moved. Do not forget to hold the Ctrl key down while moving the object. *Please refer to the [Figure 84](#)*.

Example

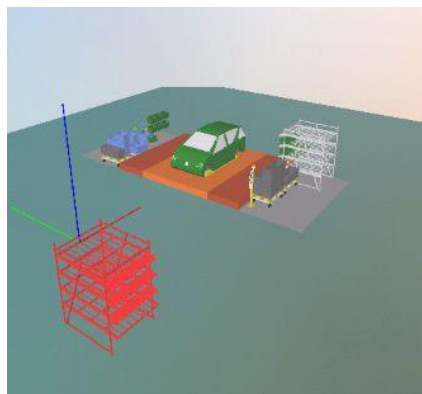


Figure 84: Selected Object has been moved from the Graphic Group

Example

Editing Entire Graphic Group

In this example, the entire graphic group is moved. To edit an entire graphic group, select **Graphic Groups** in the bill of materials structure (left window). All created graphic groups will be displayed in the right display window. Select the graphic group (**New Graphic Group** in the example) you want to edit. *Please refer to the [Figure 85](#)*.

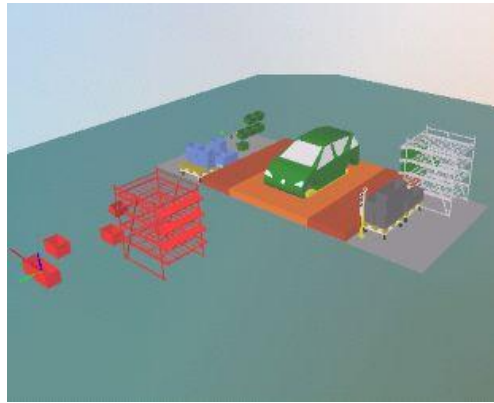


Figure 85: Entire Graphic Group has been Selected and Moved

2.11 Replace Function

You can replace an existing graphic in the bill of materials by a new graphic.

- 1) Select **Replace** function in the context menu.

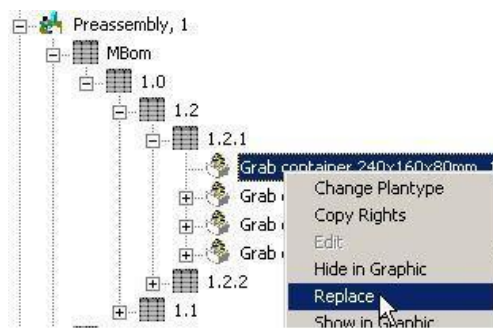


Figure 86: Replace Function in the Context Menu

- 2) The Finder with the Replace function opens. Once you have found the objects (system item) you are looking for, select the required object. Please refer to the [Figure 87](#).
- 3) Confirm your selection with **Replace**. Please refer to the [Figure 87](#).

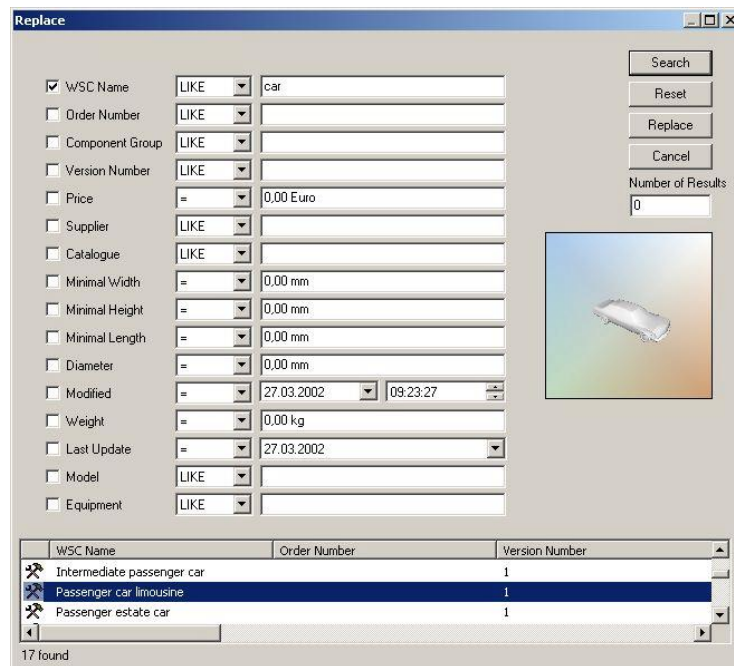


Figure 87: Finder: Replace System Item

- 4) The new system item is displayed in the bill of materials. The old system item is no longer be included in the bill of materials.

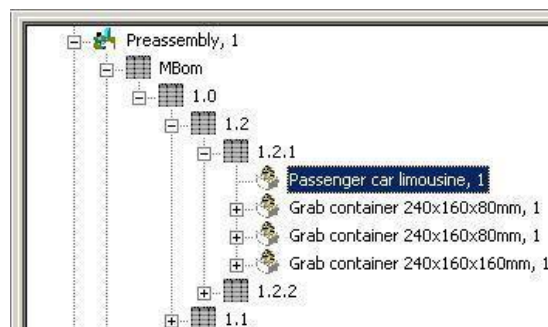


Figure 88: Replaced System Item in the Bill of Materials

2.12 Creating New Bill of Materials

Use the **Create new BOM** function to create new bills of materials and to transfer the selected objects automatically from the existing bills of materials to the new bill of materials.

In the case of selected objects, you can call this function in the Graphic menu or in the right mouse button context menu. *Please refer to the [Figure 89](#).*

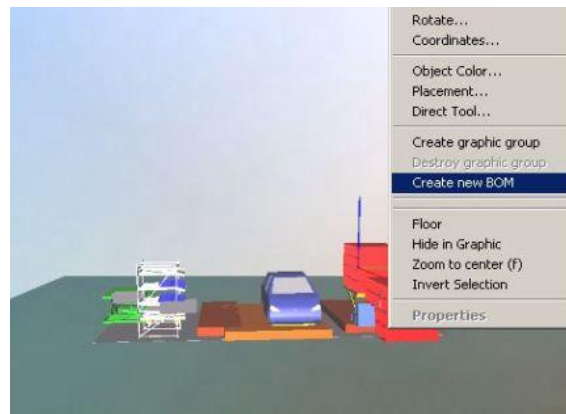


Figure 89: Creating New Bills of Materials: Two Selected Objects

In the graphic above, there are two selected objects (*Please refer to the Figure 89*) for which a new bill of materials is to be created. Until now, these two objects have been assigned to the **bill of materials for station 1 table**. *Please refer to the Figure 90.*

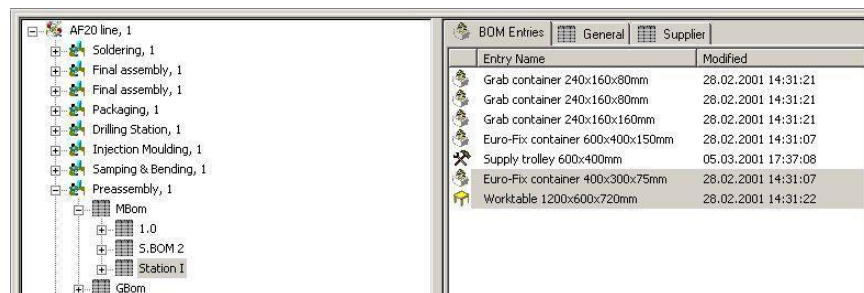


Figure 90: Bill of Materials Structure Station 1 - Table

Example

- 1) Click **Create new BOM** (*Please refer to the Figure 89*) The **Properties** dialog will open. There you can specify the new bill of materials. *Please refer to the Figure 91.*

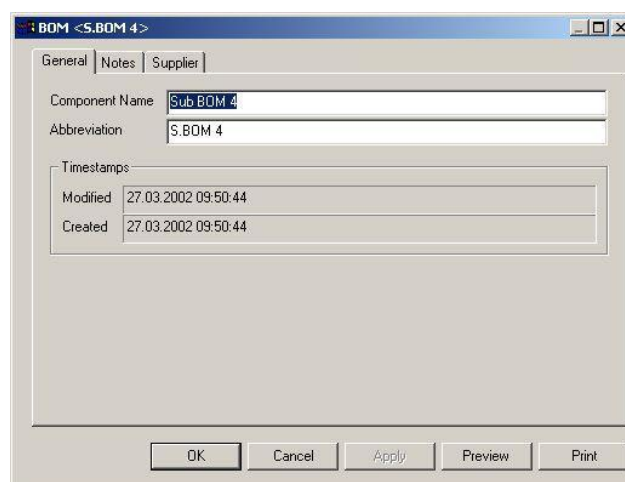


Figure 91: Properties Dialog: Create New BOM

- 2) Click **OK** button. The new bill of materials with the two selected objects will be displayed in the new structure. *Please refer to the Figure 92.*

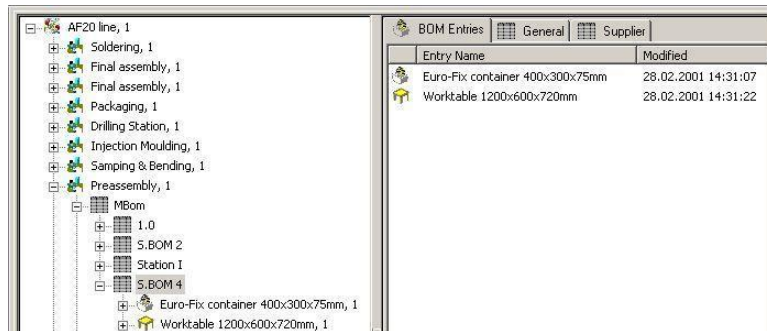


Figure 92: New Bill of Materials Structure

- 3) The two objects have been removed from the old bill of materials. Both objects are now included in the new bill of materials.

2.13 Hiding Object in the Graphic

You can call the **Hide in graphic** function in the right mouse button **context menu** and in the **Graphic** menu. With this function, you can hide selected objects in the graphic. The context function is also available for bill of materials entries. *Please refer to the [Figure 93](#).*

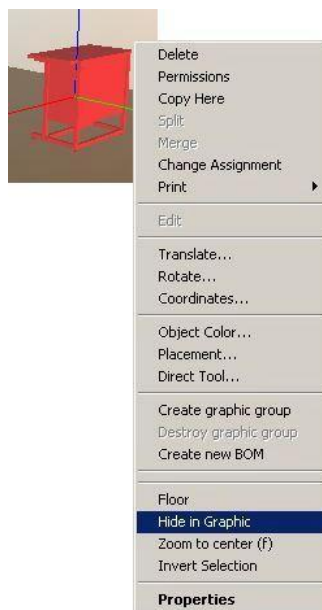


Figure 93: Hiding an Object in the Graphic

- 1) Click **Hide in graphic**. The selected object will be hidden in the graphic. *Please refer to the [Figure 93](#).*
- 2) Click on an empty space in the graphic to show the hidden object again. Afterwards, press the right mouse button and click **Show in graphic**. You can enable this function in the **Graphic** menu as well.

Example

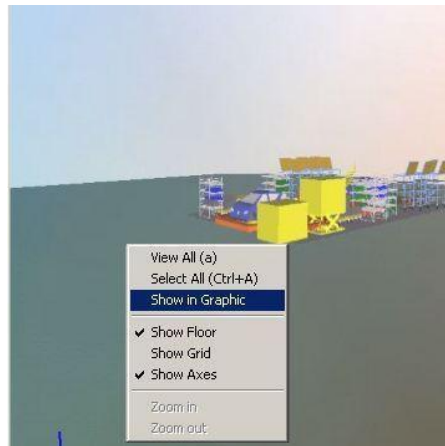


Figure 94: Show in Graphic Context

- 3) After clicking **Show in graphic**, a dialog opens. There all hidden objects are displayed. *Please refer to the [Figure 95](#).*
- 4) Select the object that you want to show in the dialog. *Please refer to the: [Figure 95](#).*

Example



Figure 95: Dialog for Hidden Objects

- 5) If you have hidden several objects, hold the Shift button down while selecting those objects you want to show again. *Please refer to the [Figure 96](#).*
- 6) Click **OK** button. The objects are visible again in the graphic. *Please refer to the [Figure 97](#).*



Figure 96: Dialog for Hidden Objects: Two Objects

Shown objects

Example

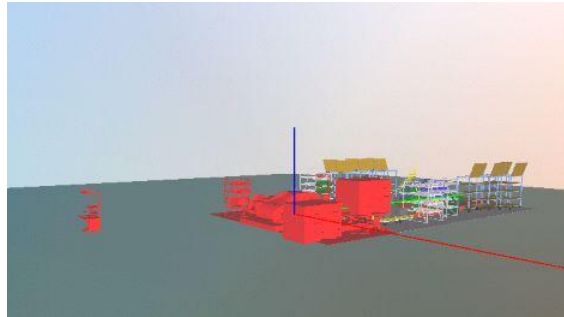


Figure 97: Shown Objects: Highlighted in Red

2.14 Annotation Sets and Annotation

The first step to annotate or to dimension a layout is to **define an annotation set**.



Note

If no annotation set is created, you cannot perform an annotation or dimensioning of the layout.

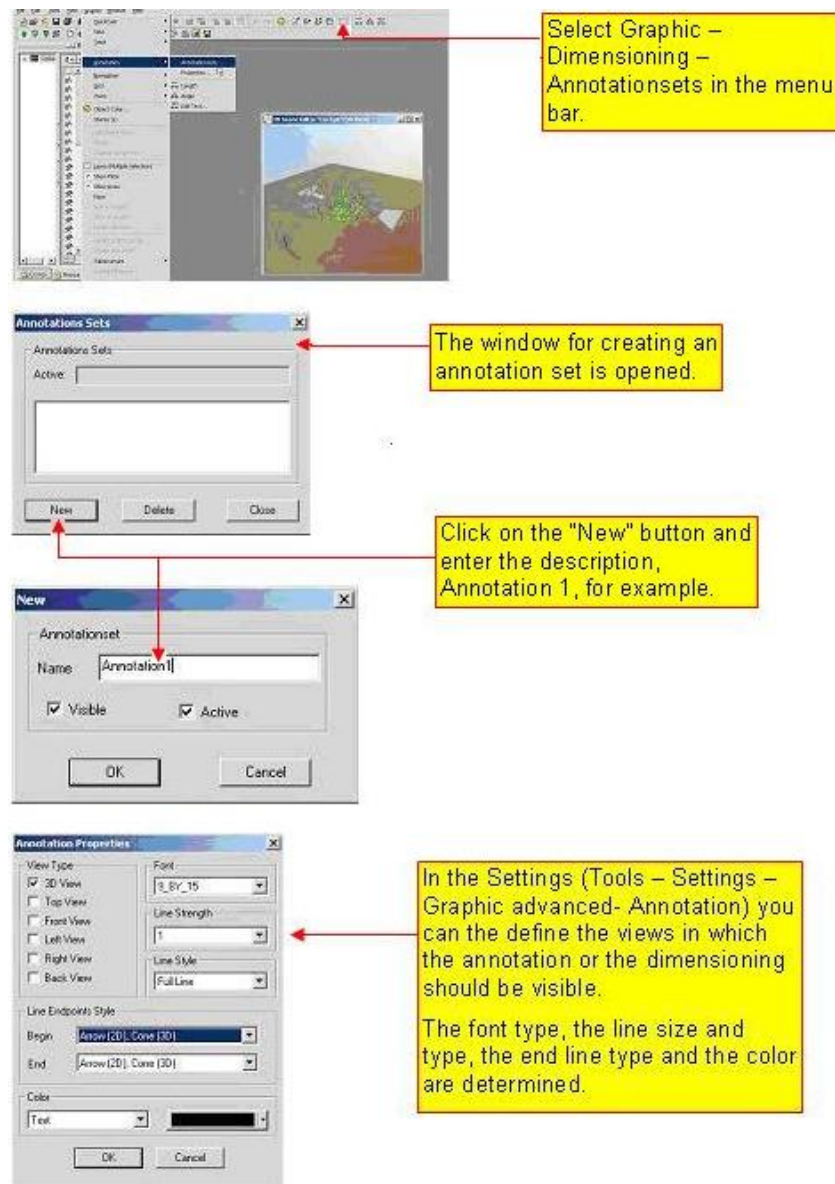


Figure 98: Annotation and Dimensioning Criteria

Example

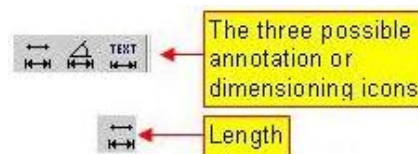


Figure 99: Annotation Icons

To dimension or to annotate a route as shown in the example below, use the **Length** icon. If the field is marked, you can perform further editing steps using the context menu.

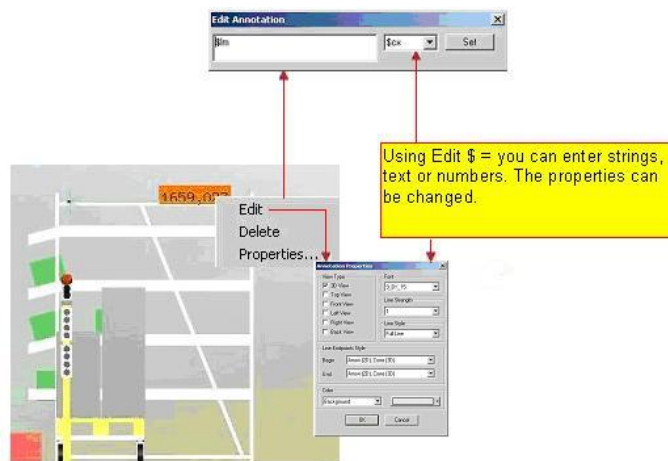


Figure 100: Dimensioning Or Annotation of the Route Length



Use the **Angle** icon to display an angle. There are two options: Angle with two edges (only possible in a two-dimensional view) and angle with three points. You can make changes in the same way as in the case of changes to the route length.

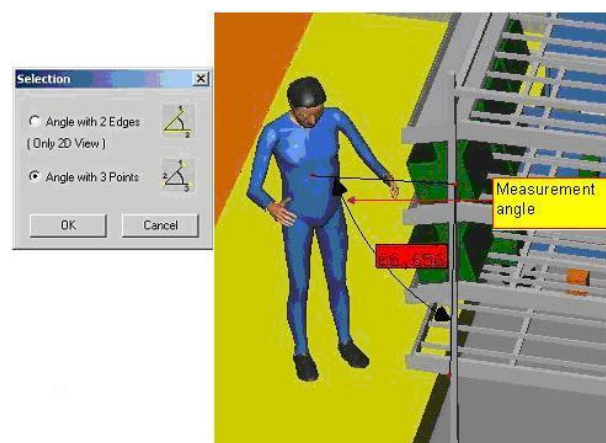


Figure 101: Dimensioning or Annotation of the Angle

Example



The **Edit text** dialog is used to enter text into a layout. If you click on the **Open text** icon, the **Edit text** window appears. You can define the text and the properties. If so called keywords like **#name#** are used, it means that the name of the object is automatically entered into the text field.

In the **Absolute** mode the text is added in global coordinates and always remains in this position.

In the **Relative** mode the text is entered in connection with the object. If you move the object, the text field is moved as well. If you checkmark the **Anchored text** box, a subsidiary line between the graphic item and the text exists.

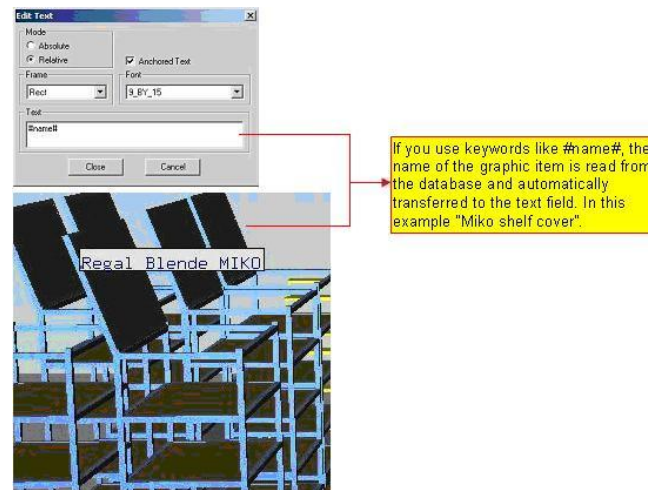


Figure 102: Setting Annotations

2.14.1 Keywords for Annotation or Dimensioning Sets

Overview of
keywords for
annotation or
dimensioning
sets

\$unit (*) used measuring unit (mm, cm, m,...)

SingleAnnotations (point measure, point annotation)

#name# (*) system item name of the selected object

\$cx global x-coordinate

\$cy global y-coordinate

\$cz global z-coordinate

\$clx local x-coordinate

\$cly local y-coordinate

\$clz local z-coordinate

Measurement Length

#name# (*) system item name of the first selected object

\$lm lengths between points

\$cxs global x-coordinate of the starting point

\$cys global y-coordinate of the starting point

\$czs global z-coordinate of the starting point

\$cxe global x-coordinate of the end point

\$cye global y-coordinate of the end point

\$cze global z-coordinate of the end point

\$clxs local x-coordinate of the starting point

\$clys local y-coordinate of the starting point

\$clzs local z-coordinate of the starting point

**Overview of
keywords for
annotation or
dimensioning
sets**

\$clxe	local x-coordinate of the end point
\$clye	local y-coordinate of the end point
\$clze	local z-coordinate of the end point

Measurement Angle (three points)

#name#	(*) system item name of the first selected object
\$wmd	measurement angle in degrees with decimal places
\$wmm	measurement angle in degrees with minutes
\$wms	measurement angle in degrees with minutes and seconds

\$cxs	global x-coordinate of the starting point
\$cys	global y-coordinate of the starting point
\$czs	global z-coordinate of the starting point

\$cxm	global x-coordinate of the vertex
\$cym	global y-coordinate of the vertex
\$czm	global z-coordinate of the vertex

\$cxe	global x-coordinate of the end point
\$cye	global y-coordinate of the end point
\$cze	global z-coordinate of the end point

\$clxs	local x-coordinate of the starting point
\$clys	local y-coordinate of the starting point
\$clzs	local z-coordinate of the starting point

\$clxm	local x-coordinate of the vertex
\$clym	local y-coordinate of the vertex
\$clzm	local z-coordinate of the vertex

\$clxe	local x-coordinate of the end point
\$clye	local y-coordinate of the end point
\$clze	local z-coordinate of the end point

**Overview of
keywords for
annotation or
dimensioning
sets**

Measurement Angle (two edges)

\$wmd	measurement angle in degrees with decimal places
\$wmm	measurement angle in degrees with minutes
\$wms	measurement angle in degrees with minutes and seconds
\$cxs	global x-coordinate of the starting point of the first edge

\$cys	global y-coordinate of the starting point of the first edge
\$czs	global z-coordinate of the starting point of the first edge
\$cxe	global x-coordinate of the end point of the first edge
\$cye	global y-coordinate of the end point of the first edge
\$cze	global z-coordinate of the end point of the first edge
\$cx2s	global x-coordinate of the starting point of the second edge
\$cy2s	global y-coordinate of the starting point of the second edge
\$cz2s	global z-coordinate of the starting point of the second edge
\$cx2e	global x-coordinate of the end point of the second edge
\$cy2e	global y-coordinate of the end point of the second edge
\$cz2e	global z-coordinate of the end point of the second edge
\$clxs	local x-coordinate of the starting point of the first edge
\$clys	local y-coordinate of the starting point of the first edge
\$clzs	local z-coordinate of the starting point of the first edge
\$clxe	local x-coordinate of the end point of the first edge
\$clye	local y-coordinate of the end point of the first edge
\$clze	local z-coordinate of the end point of the first edge
\$clx2s	local x-coordinate of the starting point of the second edge
\$cly2s	local y-coordinate of the starting point of the second edge
\$clz2s	local z-coordinate of the starting point of the second edge
\$clx2e	local x-coordinate of the end point of the second edge
\$cly2e	local y-coordinate of the end point of the second edge
\$clz2e	local z-coordinate of the end point of the second edge

The number of decimal places can be added to the keyword in brackets. 0 to 9 decimal places can be displayed.

(*) : in the case of keywords marked with (*) (\$wmm and \$wms) it is not possible to add decimal places.

Example

Example for Entering Decimal Places

\$cxe (7) means seven decimal places. If no number in brackets is specified, three decimal places are added.

Label	Description
	R = right-aligned The text alignment is based on the longest line of text. Entering a value for text alignment (left aligned, centered, right aligned) is mandatory. To achieve the effects of your entry though, the label string must be longer than one line.
Line break	You can use a percent sign % for example, to indicate a line break. All signs that are not used directly in the label string can be used to indicate a line break.
Maximum width of the text	The width of the text is entered in millimeter (mm). The text can have a maximum width of 10 000 millimeters.
Height of the text	The height of the text is entered in millimeter (mm). In the diagram of the label string for example, the height entered for the text is 200 millimeters.
Font weight	The font weight is entered in millimeter (mm). In the diagram of the label string for example, the font weight entered for the text is 20 millimeter.
Coordinates for text	The text coordinates enable you to determine the position of the text for the axis x, y, and z. These entries should be made in millimeter.
Text-rotation	Rotation enables you to determine the angle for the text. Entries are to be made in degrees.
Color of the text	The text can be created in three basic colors: red, green and blue: The individual positions for each color (also see Label String diagram) are determined by these three positions: First position = red Second position = green Third position = blue The values for colors always range between 0 and 1. The value 1 is used to select the color; for example, the text will be displayed in red if you set 1 as the value in the first position and 0 in both of the further positions of the label string. The color of the text will be made up of all three basic colors by defining the value as 1 in the other positions. The text will be displayed in black if none of the three color values have been defined with 1. All values that lie between 0 and 1 can be used, for example, entering the values 0.7 and 0.5 in the first two positions respectively creates a label string in dark orange.
Geometry of the text	The value zero enables the text to be displayed with the standard geometrical shape -letters are visible from all sides. See the following example in this chapter.
Label text	These positions are used to determine the text for the label string. This text should always be situated between the two quotation marks " ".

Entering a Label String into the Properties Dialog of a Resource

There are two possible ways to enter a label string into the properties dialog of a resource:

- The label string can either be **manually** typed in under the active *graphicname* attribute (in this example the *graphicname* attribute is represented by the line Graphic),
- The label string can be assigned to a resource by **script**.

Typing in the Label String Manually

This diagram is identical to the third example: except that the text height and weight has been reduced by 100 mm and 10 mm respectively.

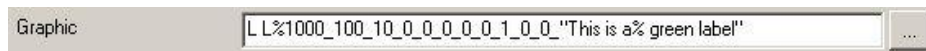


Figure 111: Label Strings

Diagram of the Label

In this example the entire word "label", is displayed, since the text height and weight are in proportion with the space given.

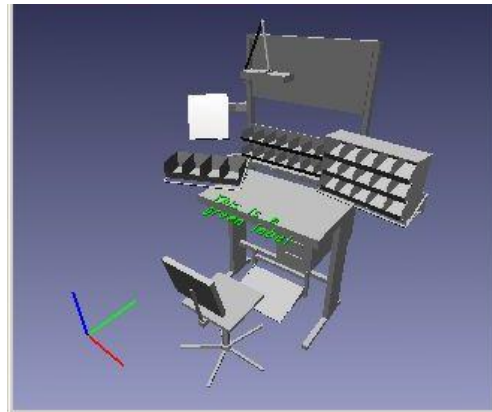


Figure 112: Example 4 – Font Size and Weight Reduced

2.15.1.5 Example Five

The diagram is identical to the fourth example: text rotation has been entered at 90°.

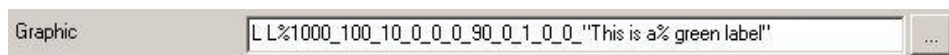


Figure 113: Label Strings

Diagram of the Label

The label displayed in this example has been rotated 90°.

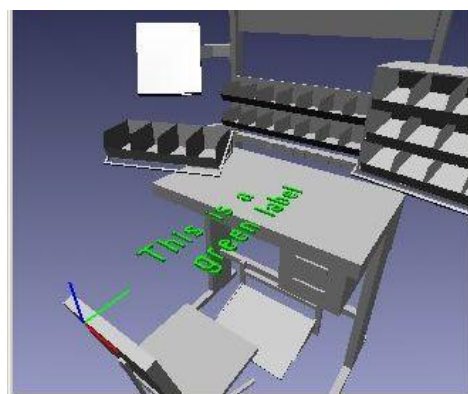


Figure 114: Example 5 – Rotation with 90° Entered

2.15.1.6 Example Six

This diagram is identical to the fifth example: except that the text position is aligned to the right.

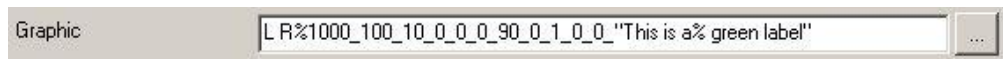


Figure 115: Label Strings

Diagram of the Label

The upper line is set to be aligned to the right in the example, because the label is adjusted according to the longest line of text.

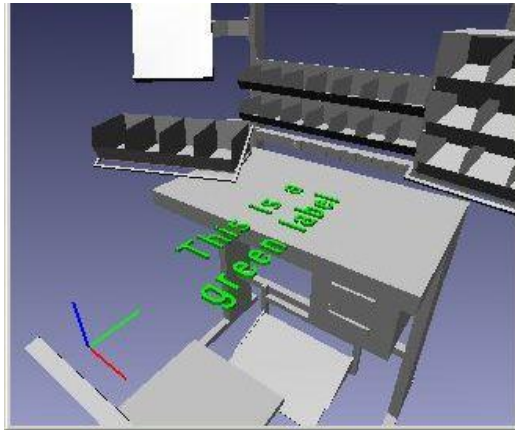


Figure 116: Example 5 – Text Position is aligned to the Right

2.15.1.7 Example Seven

This example deals with the geometry of the text.

The number that represents the geometrical value is composed of the values set forth below, which can be used individually or added together.

In the case of standard value 0, the text is displayed in the same manner as in the previous examples, except that the inner geometrical lines are not displayed.

Definition of the values:

- Value 1: only the surface area is displayed.
- Value 2: only the bottom area is displayed.
- Value 4: only the sides are displayed.
- Value 8: Only the inside of the character and the inner surfaces are displayed.
- Value 16: insignificant
- Value 32: insignificant
- Value 64: insignificant
- Value 128: insignificant
- Value 256: background is visible.

For example, you could also use the value 7 instead of the value 0: Surface area plus bottom plus sides -> $1 + 2 + 4 = 7$ are displayed.

2.15.1.8 Example 7-1

For example, when the value is set at 4, only the sides are displayed, but not the top and bottom areas.

Once again the diagram is identical to the sixth example: except that the geometrical zero entry is set to four.

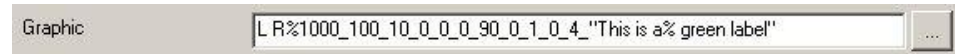


Figure 117: Label Strings

Diagram of the Label

The left picture shows that the text is transparent, because the top and bottom surfaces are not displayed.

The right picture shows a diagram of the sides.

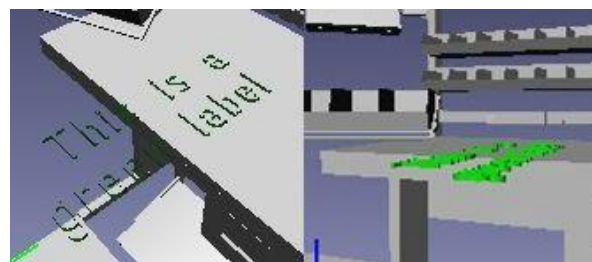


Figure 118: Example 7-1 – Geometry of the Text

Example 7-2

Once again the diagram is identical to the sixth example: except that the geometrical zero entry is set to nine.

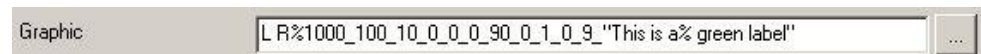


Figure 119: Label Strings

Setting the value 9 (1+8) will mean that only the top surface will be displayed, without the bottom or sides.

The left picture shows the top view of the label. The right picture shows the side view, which shows that the label cannot be displayed from this viewpoint because the sides are not displayed with this value.

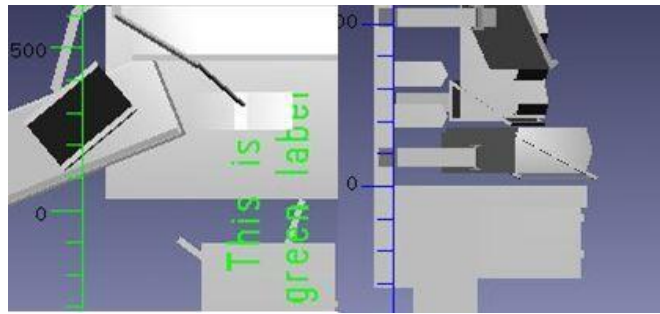


Figure 120: Example 7-2 – Geometry – only the Top is Displayed

2.16 Saving View Settings

If you have opened a graphic window, you can set and save as many views as you like. In practice it often occurs that a layout is to be displayed in different views; use the **Save view settings** function for this purpose. You can save and reactivate as many views as you like. In addition, you can use the **Save view settings** function for creating videos if, for example, you want to create multiple scenes you can access the saved views.



For more information on how to create videos, *Please refer to the [Camera Tools Manual](#).*

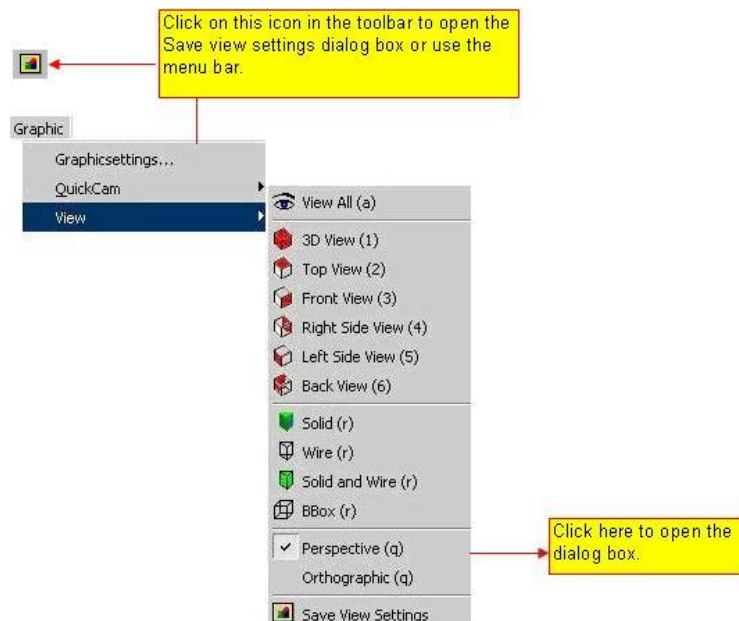


Figure 121: Save View Settings Dialog

Example

- 1) Open the **Save view settings** dialog using the **Graphic** menu. *Please refer to the [Figure 122](#).*
The **View settings** dialog box comes with a scene example for saving graphic scenes.
- 2) Using **Add view** you can add individual views from the graphic.

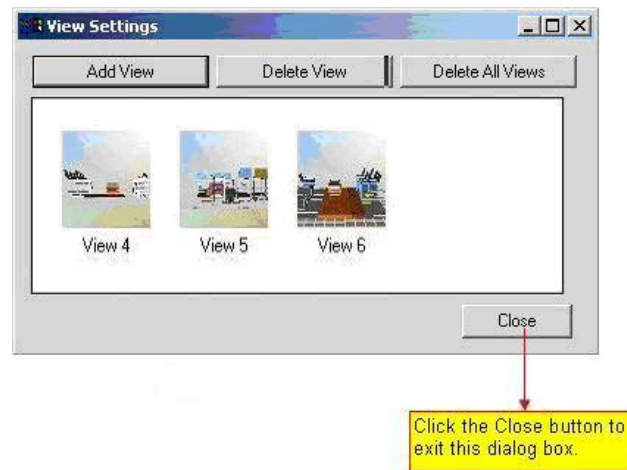


Figure 122: Saving View Settings

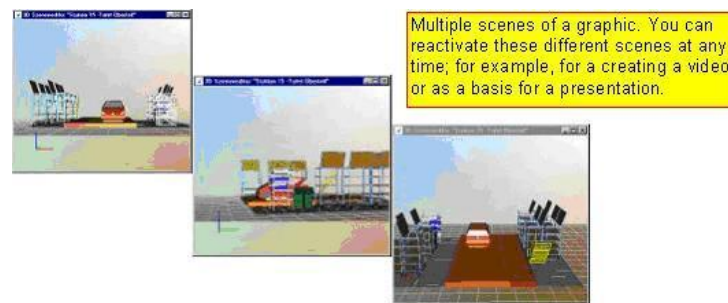


Figure 123: Different Views/Scenes of a Graphic



Note

All pictures saved using **Save view settings** can be reactivated and used for your work. You can, for example, present different layout views or use them for video recordings.

Example



Procedure for adding and saving views

- 3) You have opened the graphic. Using **Add view** you can assign as many views as you like to the **Save view settings** dialog.
- 4) Either click icon in the toolbar or open it using the **Graphic** menu. The **Save view settings** dialog box is opened. Please refer to the [Figure 122](#).
- 5) Click **Add view**. The graphic is saved as a bmp-file and is displayed in the dialog box.
- 6) Set a new view in the graphic and then click **Add view**. An additional picture is saved and is shown in the dialog box. Repeat this procedure as often as you like until all views have been added.
- 7) Using **Delete view** you can delete selected pictures from the dialog box.
- 8) Using **Delete all view** you can delete all pictures from the dialog box.

3. Right Mouse Button Functions

The right mouse button context menu provides multiple functions that you can use correspondingly for your work. The context menu can be opened in a **free layout** or with a **selected object**.

A graphic, for example, can be shown with or without a floor.

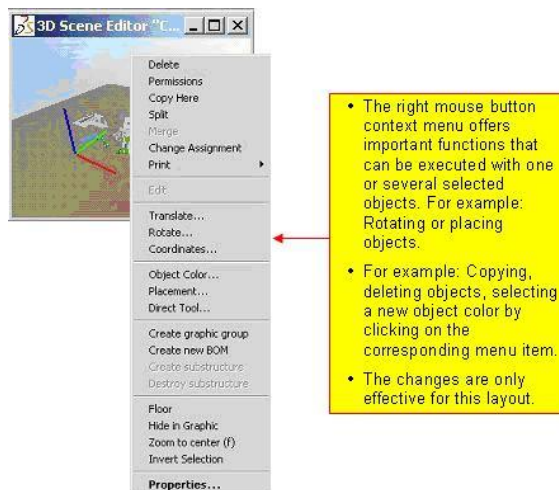
3.1 Context Menu in a Free Layout

- 1) To get to the context menu click on a free place in the layout. An enabled function is marked with a checkmark. Select the required function from the context menu.



Figure 124: Right Mouse Button Functions in a Free Layout

3.2 Context Menu with a Selected Object



- The right mouse button context menu offers important functions that can be executed with one or several selected objects. For example: Rotating or placing objects.
- For example: Copying, deleting objects, selecting a new object color by clicking on the corresponding menu item.
- The changes are only effective for this layout.

Figure 125: Context Menu with a Selected Object

Example

Example: Floor function

- 1) You want to place the levitating yellow body on the floor again.

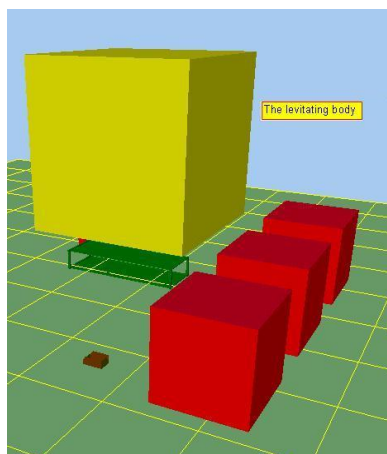


Figure 126: Levitating Body

- 2) Select the body, then press the right mouse button.

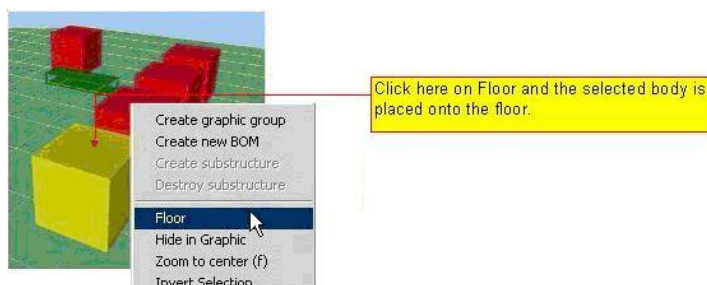



Figure 127: Body is Placed on the Floor

3.2.1 Lasso Function

Quickly selecting
objects using the
Lasso function

Selecting objects of a graphic using the Lasso function. Use the Lasso function to select multiple objects in a graphic.

- 1) Select the Lasso function using the Graphic menu or the toolbar .

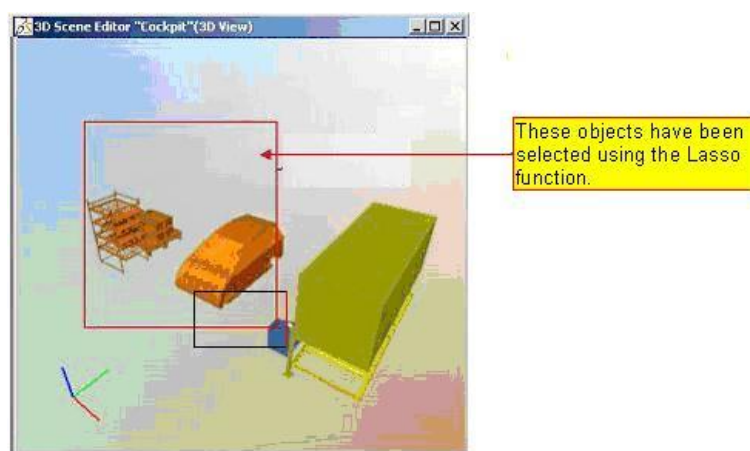


Figure 128: Selecting Object with the Lasso

- 2) Press the left mouse button afterwards and draw a frame around the objects while holding down the mouse button. All objects within this frame are selected. Please refer to the [Figure 128](#).



- 3) After selecting the objects with the Lasso function, the context menu with functions is available for the selected objects. *Please refer to the [Figure 125](#).*

3.2.2 Moving Objects using the Cursor



Selected objects can also be moved directly using the mouse while simultaneously **holding down the Ctrl key**. This keyboard shortcut is available in two- and three-dimensional views.

Moving selected objects. The cursor changes its shape during the moving process. Hold down the Ctrl key.

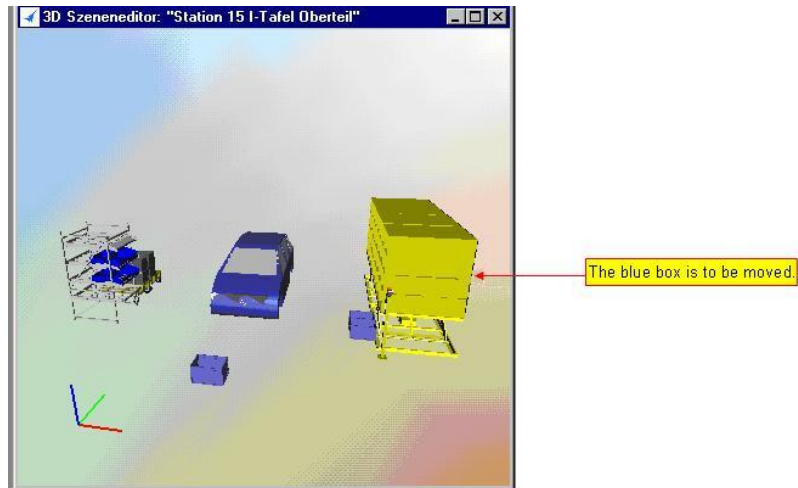


Figure 129: Moving Objects

Select the object in the graphic and then press the Ctrl key. The object (blue box) can be moved using the cursor while holding down the Ctrl key.

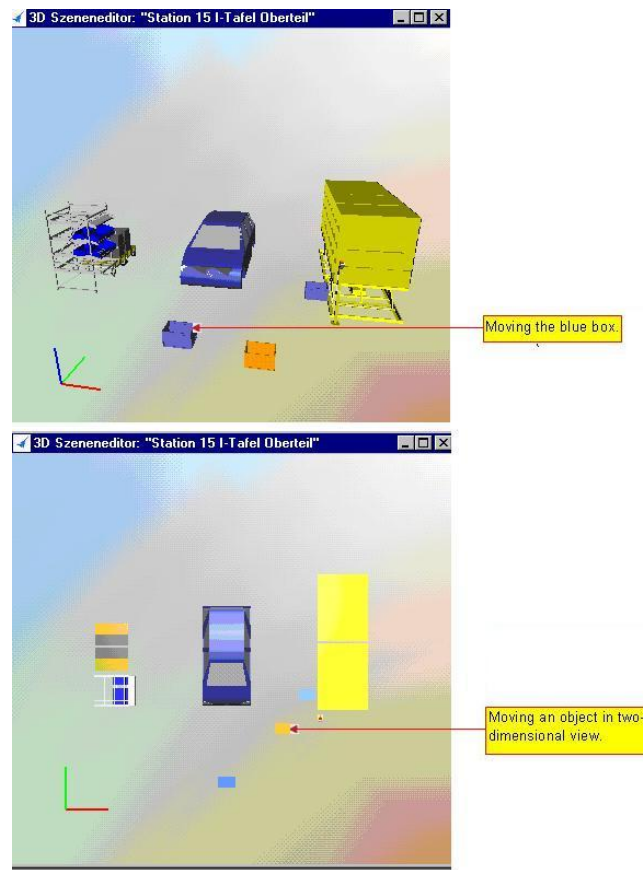


Figure 130: Moving Selected Objects

3.2.3 Split and Merge Function

Using the **Split** and the **Merge** functions, combined graphic objects can be split and merged again.

A system usually consists of several combined stations. Using the **Split** and the **Merge** functions a combined system can be split and merged again. If, for example, a station is to be added to another system and is to be merged into a unit (is to build a unit) with the other stations of this system.

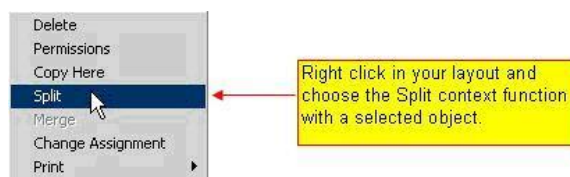


Figure 131: Split Context Menu

Example

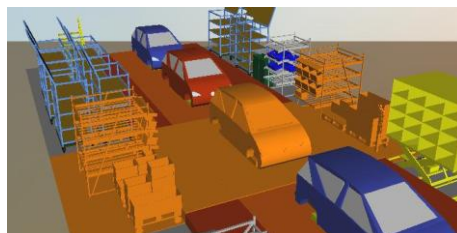


Figure 132: Split Function with a Selected Object

A system divided using the **Split** function; the individual objects can be edited.

Using the *Split* and the *Merge* functions, combined graphic objects can be split and merged again.

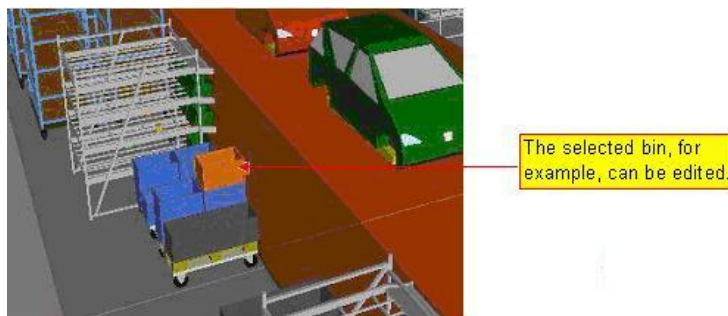


Figure 133: System Divided into Single Components

Merge a system using the **Merge** function.

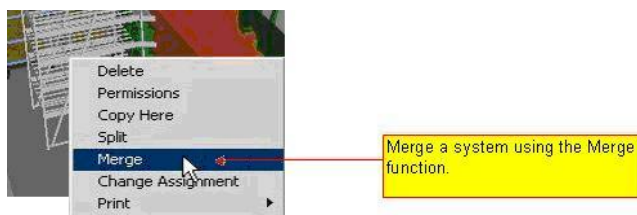


Figure 134: Merge Context Menu

3.3 Graphic Files for DPM-V5

The **Create Preview Graphic** context function enables you to create graphic files in the ...cgr format, which can be used in DPM-V5.

Using a script will enable you to create graphic files via the context menu.



For more information on how to create graphic files using scripts, *Please refer to the [Scripting Manual](#).*

The **Create Preview Graphic** context menu entry is available in both the product and resource structures.

Unless the user has superuser rights, the user must obtain **Create Preview Graphic** function permission to carry out this function.

- In the product structure this function is available in the PPR-Navigator, list-view and in the open graphic window.
- In the resource structure this function is available in the PPR-Navigator and listview.

Graphic files that are created using **Create Preview Graphic**, are saved in the preview_graphic directory.

- 1) The path in PE 5.17 is by default, preset: in the DELMIA\PPRClient\data\preview_graphic directory.
- 2) Path or directory changes can be carried out by way of the menu **Tools < Settings < Maintenance < Global < graphic_editor**.

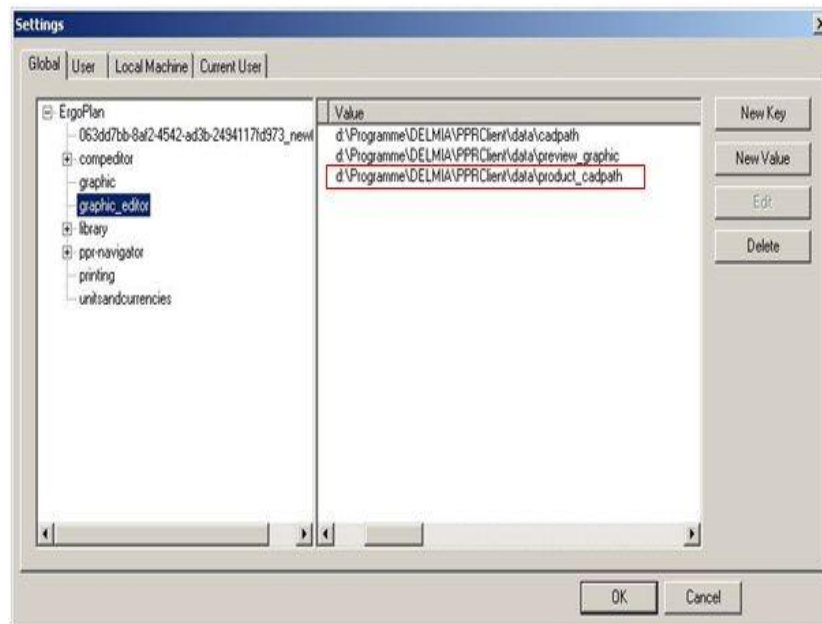


Figure 135: Settings Dialog – Graphic Files Directory

3.3.1 Creating Graphic Files

The children of a selected parent node are also included when creating a graphic file.

- 1) Open the context menu by right-clicking the mouse on a selected object.
 - 2) Select the **Create Preview Graphic** menu entry. In the example, the function is carried out in the product structure.
- The same procedure can be used in listview, resource structure, and in the graphic window.

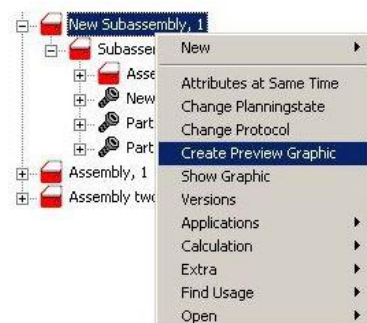


Figure 136: Create Preview Graphic is to be carried out via the Context Menu

The graphic files that have been saved in the *preview_graphic* directory are displayed in ...cgr format:

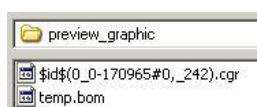


Figure 137: Display of Saved Files in the Preview_graphic Directory

3.3.2 Multiple Paths in Graphic Path Variable

Now you have the capability to support multiple directory locations for storing product graphic files using existing setting “product_cadpath”.

To localize CAD Data:

- 1) Go to **Tools > Settings > Maintenance Tool > Global tab > Import DL Names**.

By default **Import DL Names** button is deactivated. On selection of tree node “graphic_editor”, this button is activated.

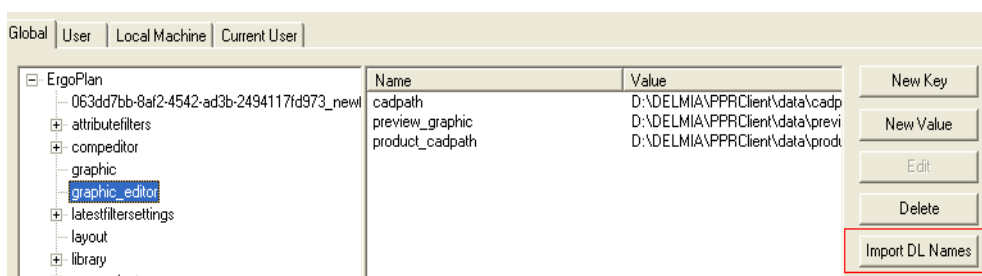


Figure 138: Import DL Names

- 2) Click **Import DL Names** and select DL Names file to import.
This way E5 can import the text file exported by V5 for DLnames.
- 3) Enter/ browse the relative name of the graphic file in **CAD File**.
- 4) Click “Show Graphic” on product component, the graphic displays. *Please refer to [Showing Graphic in the Product View](#).*



Note

Import functionality imports only DL locations (valid directory locations), but not DL Names (name of directory location).



Note

Give unique name for CGR files, if two or more CGR files with same file name exist in two different cad paths, then the first found graphic file is loaded for display.

Each directory location is separated by semicolon (;). The value is limited in 2000 characters in length (database limit).

With the capability to support multiple directory locations using setting “product_cadpath”, the dependency modules (DPE Graphics, V5 -module loads data from M-Hub, PPR loader, DBMigration etc) which are considering this setting also get modified.

When graphic files are created or moved in new directory location, make sure that the new path has been added to setting “product_cadpath” before running command “Show Graphic”. Otherwise no graphic is displayed in the graphic window. The workaround for this is to add ‘\’ (remove, if it already exists) to the start of the relative path then the graphic starts appearing in the window.



Figure 139: Change in Relative Path when Graphic Files Created/Moved

This problem occurs for the first time when you includes a new path in "product_cadpath" and for the first selection of graphic file (cgr) in that path.

4. Working in Complex Layout

Editing complex layouts requires quick and efficient access to functions. Some of these special editing possibilities are shown using a complex layout.

4.1 Showing Graphic in Context

- 1) Select the station you want to edit in the bill of materials by right-clicking on it. Stations that are not selected are highlighted in grey/blue and cannot be edited.

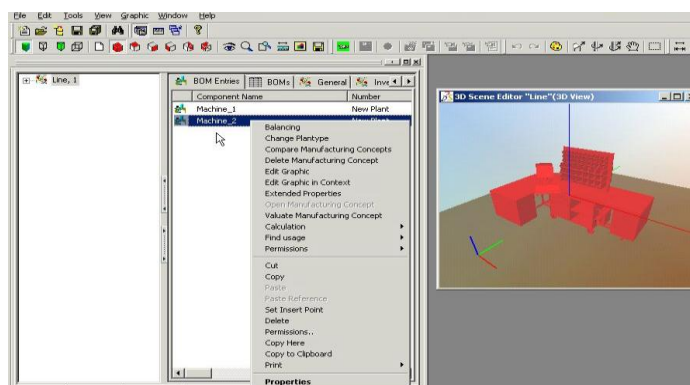


Figure 140: Layout Consisting of Three Stations

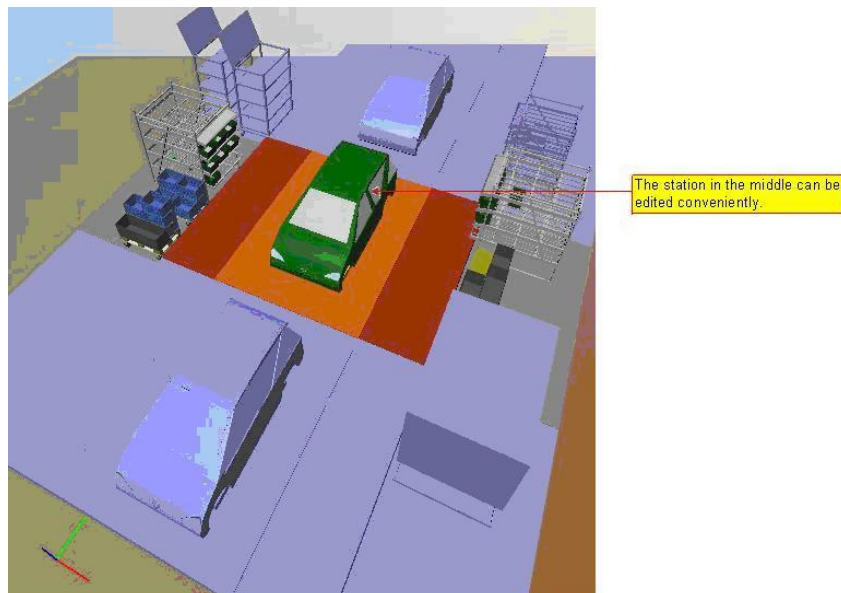


Figure 141: Layout in Context

- 2) To show the graphic unselected again close the graphic opened in the context.

4.2 Showing Graphic in Advanced Context

Using the **Show graphic in advanced context** function you can show and edit sections in a selected context of an entire graphic. In the Process Engineer an entire graphic corresponds to a resource structure usually consisting of several hierarchical levels. Graphics in turn are assigned to the individual hierarchical levels. An entire graphic is the sum of the individual graphics of all hierarchical levels of the resource structure.

Using this function you can select the context by either editing or showing the graphic on one of the assigned hierarchical levels.

What is achieved by this approach? Smaller editing steps, for example, are executed at a smaller station of the entire system in a larger context of the entire graphic. The effects can be immediately reproduced in this selected context; corrections can be executed immediately without having to open the entire graphic of the entire system, for example.

To Open Graphic in Advanced Context

The **Graphic in advanced context** function is available in the resource view.

- 1) In the PPR Navigator change from the resource structure to the resource view.
- 2) For this purpose, in the PPR Navigator select the hierarchical level in the resource structure and select the **Open this application** entry from the context menu.

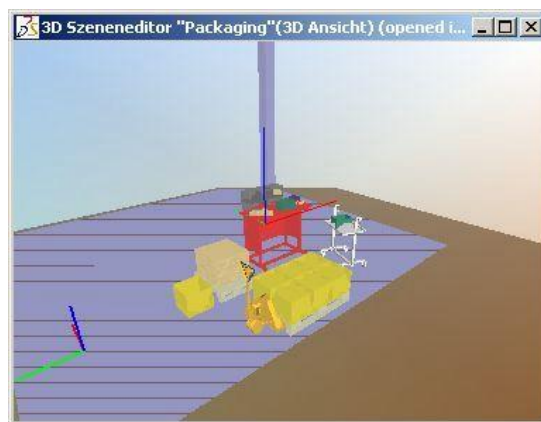


Figure 142: Section in Context with Default Setting 25%

- 3) In the resource view open the resource structure up to the hierarchical level where you want to open the graphic editing.



Figure 143: Open Graphic in Advanced Context

- 4) Click **Edit graphic in context advanced** entry.
- 5) In the Select context dialog select the context where you want to show or edit the graphic of the selected hierarchical level. In the Show in context of selection list all higher hierarchical levels are shown that are available for the context display.



Note

Select **none** at Position of DXF-files.



Figure 144: Select Context Graphic Editing Dialog

The selected context is marked blue in the scene editor and cannot be edited. The size in which the context is to be displayed can be set in the settings of the Graphic Tools tab; the context can be displayed with a zoom of up to 200%. This means: You can select between **1% – 200%**. The graphic objects of the selected hierarchical level are displayed in the selected object colour and can be edited.

- The default setting is 25%.

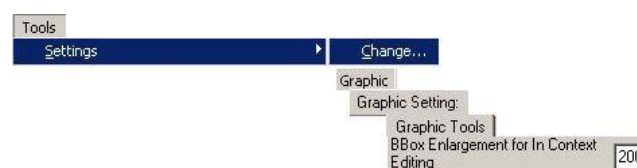


Figure 145: Determine Percentage Rate for Context Display

Context display, enlargement 25%

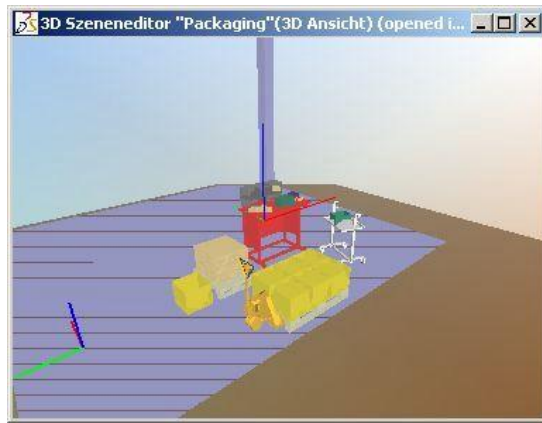


Figure 146: Context display 25%

Example

The same context display at 200%. In this example the system will be displayed in full volume. Compare to the context display at 25%.



Figure 147: Context Display 200%

4.3 Hide in Graphic

- 1) Select the item or the station that you want to hide in the graphic. You can add other items instead, i.e. insert a different kind of station. If you save both layouts as view, you can use them in presentations or for your decision-making process in the case of multiple possibilities.

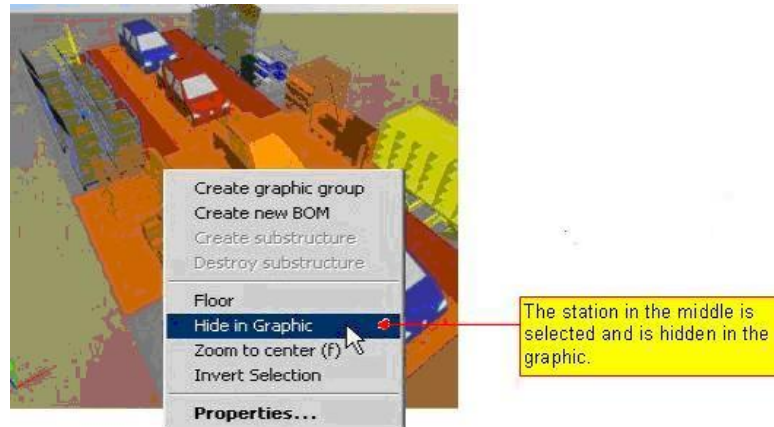


Figure 148: Hide in Graphic

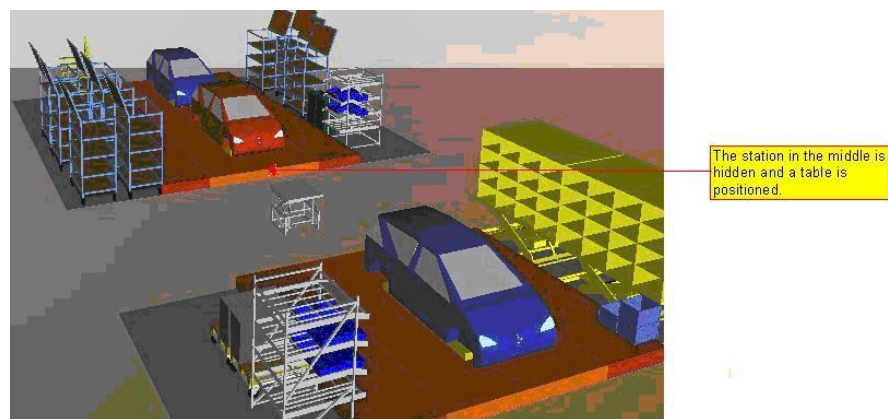


Figure 149: System with Hidden Station

- 2) It is possible, of course, to show the object again. You can choose from a list of hidden objects, after you have enabled the context menu in the layout. *Please refer to the [Figure 151](#).*

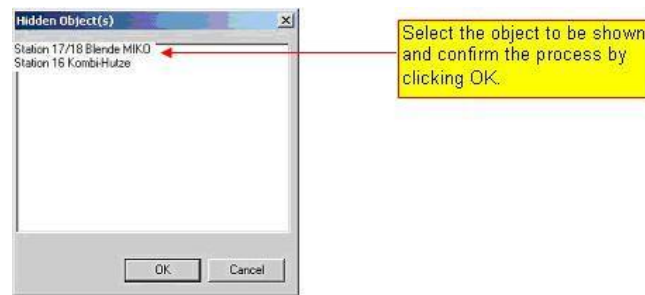


Figure 150: Selection List of Hidden Objects

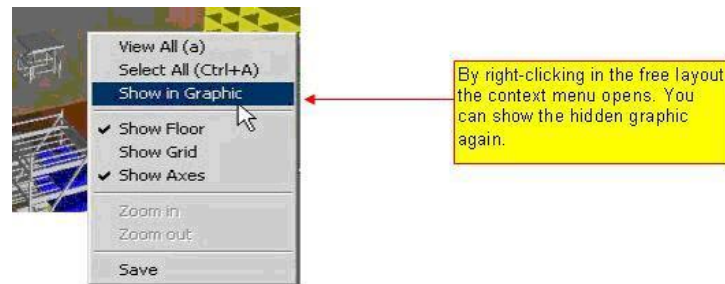


Figure 151: Show in Graphic Context Menu

4.4 Showing Graphic in the Product View

The **Show Graphic** function in the context menu of the product structure, has been extended in the new PE 17.0 version. All of the functions in this chapter (such as the selection of objects in the graphic window) that are specified on the following page, are only available in the product subassembly graphic window.

- 1) To open a graphic window, select the hierarchical level from the product structure, and open the context menu by right-clicking the mouse.
- 2) Select **Show Graphic**.

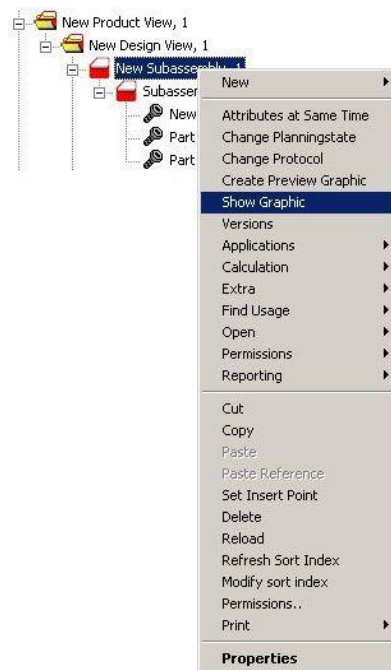


Figure 152: The Context Menu in the Product Structure

Extended Functions

- Graphic objects can be selected from an open graphic window. Simultaneous multiple selections are possible. *Please refer to the [Selecting Graphic Objects in the Graphic Window](#).*
- Selected objects can be highlighted in the graphic window as well as in the listview. *Please refer to the [Highlighting Selected Graphic Objects](#).*
- The context menu available for an object selected in the graphic window, is the same as the one available for an object selected in the PPR-Navigator of the product structure. *Please refer to the [Displaying the Graphics Context Menu in the Product Structure](#).*
- Drag and Drop in PPR-Navigator, listview, and graphic window. *Please refer to the [Using Drag and Drop](#).*
- Deleting graphic objects in the graphic window. *Please refer to the [Deleting Objects in the Graphic Window](#).*
- Grouping and dividing subassemblies in the Graphic menu. *Please refer to the [Merging and Splitting Graphic Subassemblies](#).*

Selecting Graphic Objects in the Graphic Window

You can select an individual graphic object, or several graphic objects simultaneously in the open graphic window. Objects can only be selected from the graphic window of product subassemblies.

- 1) An individual object can be selected by left-clicking the mouse on the graphic object in the graphic window.
- The selected object is displayed in the color selected – the graphic object selected in the example is displayed in green.

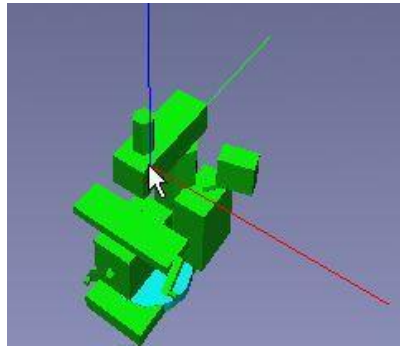


Figure 153: Selecting an Individual Graphic Object

- 2) By holding down the left mouse button along with the Control key, you can select several graphic objects simultaneously.
 - The selected objects are displayed in the color selected – both of the graphic objects in the example are displayed in green.

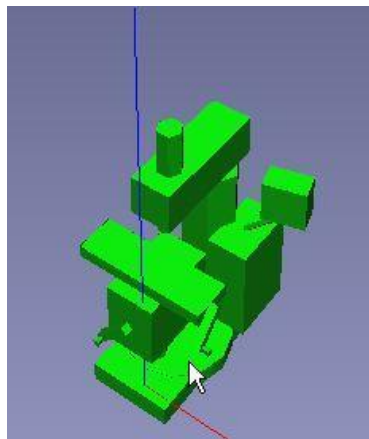


Figure 154: Selecting Several Graphic Objects

Highlighting Selected Graphic Objects

Graphic objects can be highlighted in both the listview, and graphic window.

The graphic object in the example, is selected in the graphic window. The object is highlighted in the listview.

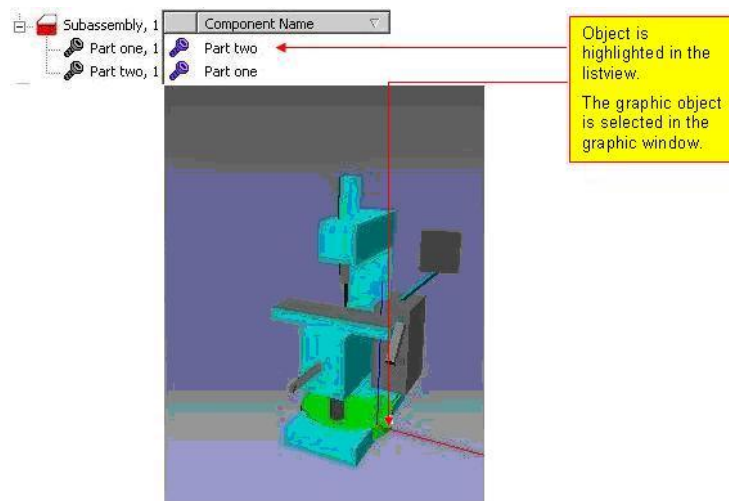


Figure 155: Object is highlighted in the Listview

- 1) If you select an object from the listview, the graphic object is highlighted in the graphic window. Several objects can be selected in the listview, which are in turn highlighted in the graphic window.
- 2) Whether you select one or several graphic objects in the graphic window, the corresponding objects in the listview will be highlighted.
- 3) Hold down the Control key to select several objects.

Displaying the Graphics Context Menu in the Product Structure

- 1) Select a graphic object in the graphic window, and open the context menu by right-clicking the mouse.

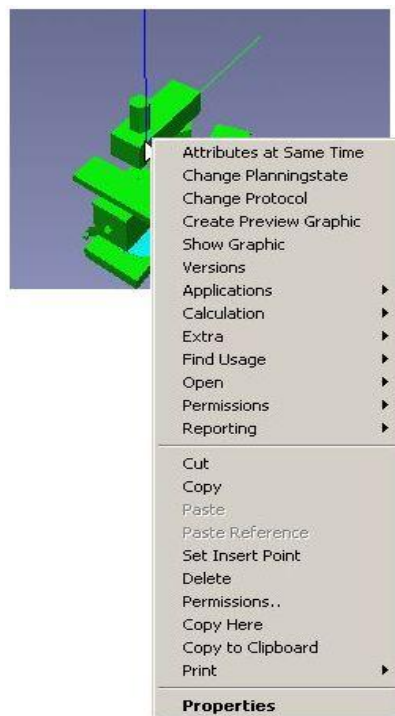


Figure 156: The Context Menu of the Selected Object in the Graphic Window Using Drag and Drop

Drag and Drop enables you to insert objects from the PPR-Navigator or the listview, into the graphic window. The newly inserted objects are now visible in the graphic window, and are added into the product structure of PPR-Navigator.

- Objects that are inserted into the graphic window by Drag and Drop are referenced, which means that they are referenced under an original object and are not independent objects.



For more information on Drag and Drop and Referencing objects, *Please refer to the [General Introduction Manual](#).*

You can also use Drag and Drop to assign graphic objects in the graphic window to a product structure.

- Objects that have been assigned from the graphic window to a product structure using Drag and Drop, are copied, which means they are independent objects. So these objects can continue to be used and worked with independent of the original objects.
- 1) Select the graphic object (you can also select several graphic objects), to assign it from the graphic window using Drag and Drop to a product structure.
 - 2) After that, press and hold the Control and ALT keys and drag the selected graphic object into the product structure.

Example of Drag and Drop – PPR-Navigator

- 1) To insert a graphic object from the PPR-Navigator or listview, into a graphic window using Drag and Drop, select the object with the left mouse button and drag it into the open graphic window.

The basic procedure is demonstrated in the following example:

- 2) Open the product structure of the graphic window.

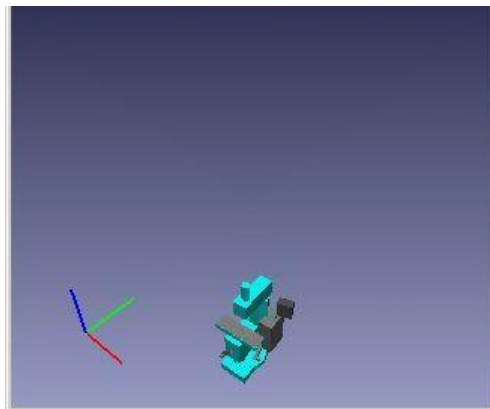


Figure 157: Picture 1 – Initial State

- 3) Using the left mouse button, select the object in the product structure.

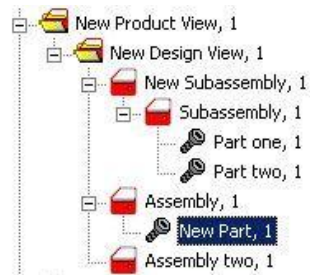


Figure 158: Picture 2 – Selecting the Object in the Product Structure

- 4) The next step is to drag the selected object onto the graphic window using the left mouse button, and drop it there. To drop the object, release the mouse button. The graphic object has been inserted into the graphic window.

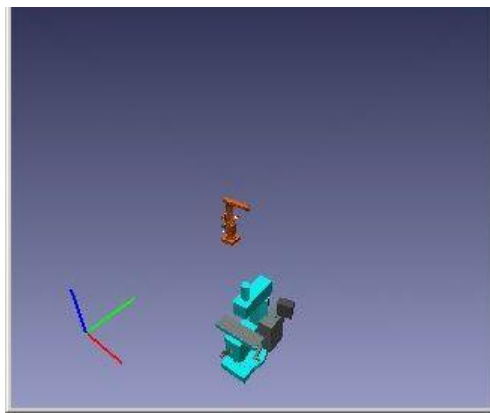


Figure 159: Picture 3 – Insert the Graphic Object into the Graphic Window

The graphic object that was inserted into the graphic window, is displayed in both the new and the old product structures.

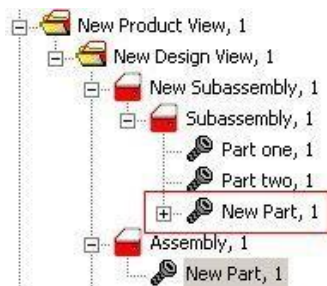


Figure 160: Picture 4 – Object is Displayed in the Product Structure

Deleting Objects in the Graphic Window

Two important points should be clear when deleting objects in the graphic window:

- Referenced objects are completely deleted: objects for instance that were inserted by Drag and Drop into the graphic window.
- Only the selected object is deleted, in the case of copied objects.



For more information on deleting objects, *Please refer to the [PPR Navigator Manual](#).*

- 1) To delete a graphic object, select the object from the graphic window and open the context menu by right-clicking the mouse. Several graphic objects can be selected and deleted at the same time.
- 2) Select **Delete** entry in the context menu.

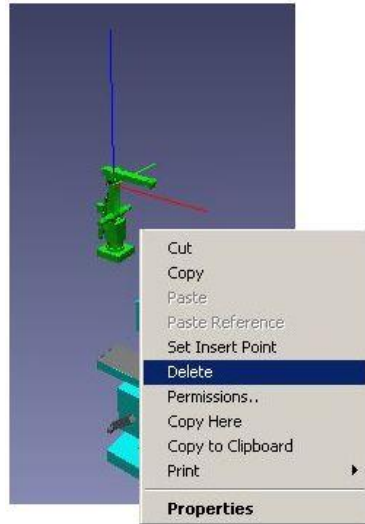


Figure 161: Deleting Graphic Objects

- 3) When the window appears, click on the appropriate option - **Component Flat** or **Deep**. The **Deep** option should be used for an object that is assigned to a structure (child), which should also be deleted.
- By using the **Link Flat** option, the relations that exist between objects are deleted.

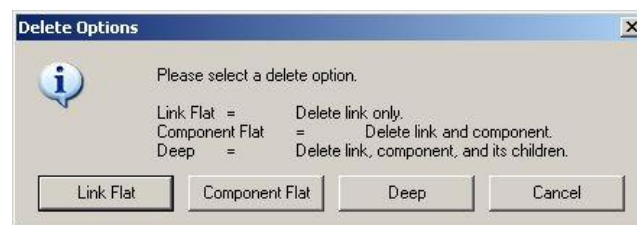


Figure 162: Delete Options

In the example, the **New part** object inserted (referenced) into the graphic window by Drag and Drop, is deleted from the graphic window. *Please refer to the [Using Drag and Drop](#).*

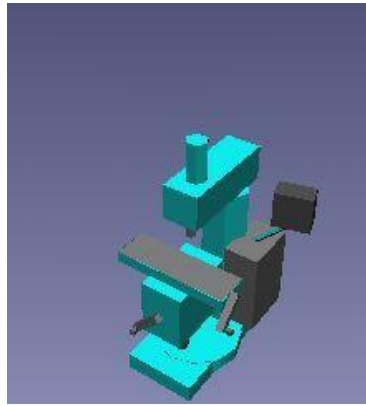


Figure 163: Graphic Object is Deleted in the Graphic Window

The referenced object is completely deleted from the product parts list.

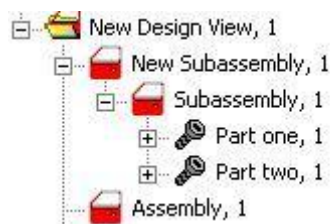


Figure 164: Object is Completely Deleted from the Product Structure

Merging and Splitting Graphic Subassemblies

The **Show Graphic** function in the product structure, enables you to break down and then merge graphic groups in the open graphic window. These two functions are available in the Graphic menu. Only graphic groups can be split and then merged.

- The graphic group splitting and merging functions in the Graphic menu are temporary. Once a graphic window has been closed and is reopened, the graphic groups are no longer split when displayed.
- So saving changes is not possible - for example, when a graphic window has been closed and is reopened, divided graphic groups are together again when displayed.

Graphic groups are created in the product structure, with the aid of product subassemblies that share the same parent node. The Split function can for example, be used to display the individual objects of graphic groups in the graphic window.

The following will help familiarize you with the basic procedure:

In the following example, a graphic subassembly should be formed again from the **New Subassembly** product subassembly which is made up of the **Subassembly** and **Assembly two** subassemblies.

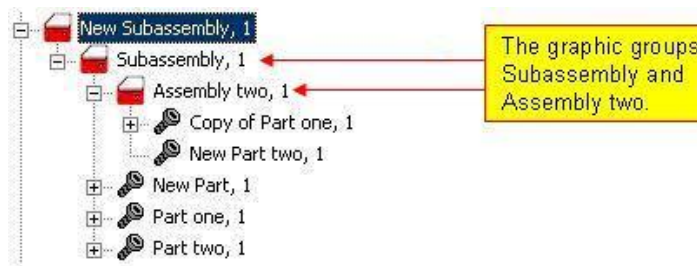


Figure 165: Picture 1 – New Subassembly Product Structure

- 1) In the **New Subassembly** parent node, open the graphic window in the product structure.
- 2) Select any object in the graphic window.
 - Since the graphic groups are siblings, the graphic subassemblies create a single graphic group for this parent node – for instance, all of the objects belonging to these subassemblies are displayed in the selection color green.

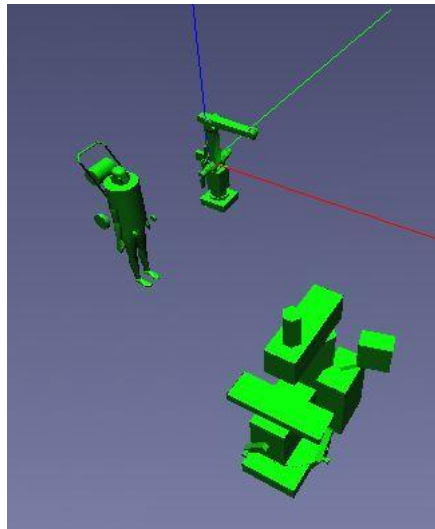


Figure 166: Picture 2 – Graphic Group for New Subassembly

- 3) To display individual objects from graphic groups, select **Split/Select next select** in the Graphic menu.
 - In the example the graphic group is made up of two graphic groups. To display all objects from the graphic groups, the **Split/Select next select** function must be carried out for each graphic group. So twice in the example.

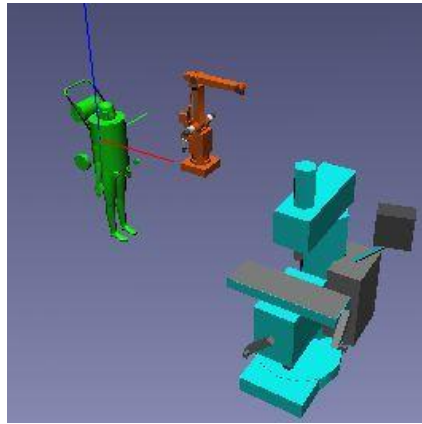


Figure 167: Picture 3 - Individual Parts of the Subassembly Graphic Group

- Picture 4 shows all of the objects for both of the graphic groups.

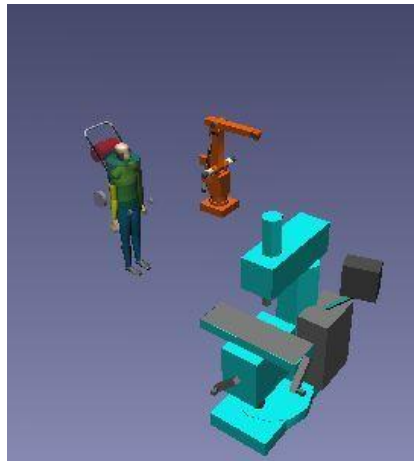


Figure 168: Picture 4 – All of the Individual Parts are Displayed

- 4) Select the **Merge** menu entry in the graphic menu, to close graphic groups in the open graphic window. To close all of the graphic groups, though, you must close all of the open graphic groups individually. Once again, twice in the example.

4.5 Geometry Caching in DPE

This functionality does not copy the geometry of resources in DPE.

- If the referenced file already is in the cadpath or in the product_cadpath directory no path is used in the graphicname, only the name of the file is used.
 - If the referenced file already is in a subdirectory of cadpath or product_cadpath the absolute path is changed to a relative path.
 - Other source files get copied if this setting is not set.
- 1) Go to **Tools < Settings < Change < Maintenance Tool < Global**.
 - 2) Set graphic/not_copy_cad_files value to 1. Please refer to the [Figure 169](#).

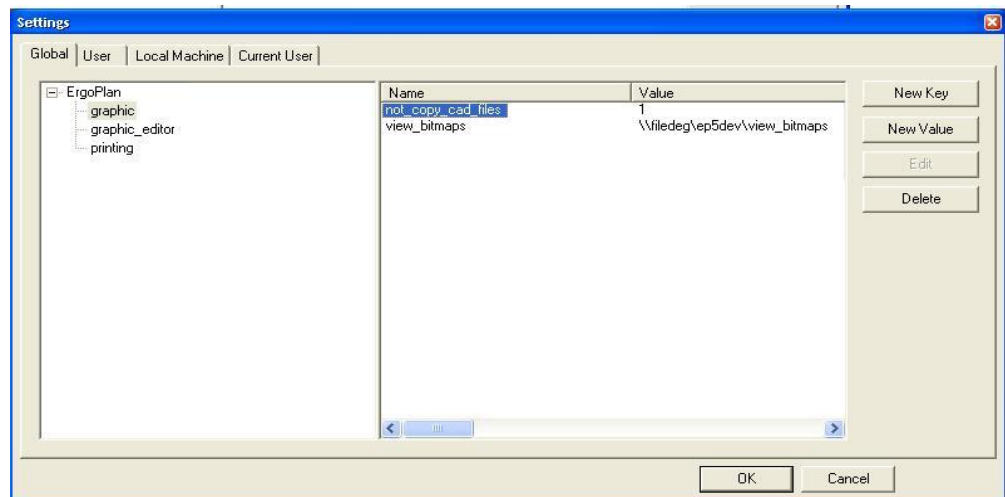


Figure 169: Settings to not Copy the Geometry of Resources

- 3) Open Insert Tool of the WSC graphic editor, it is not possible to add CAD files to the list of files, since the **Add to tree button** is disabled. The **Add to tree** functionality copy such files into the cadfile directory.

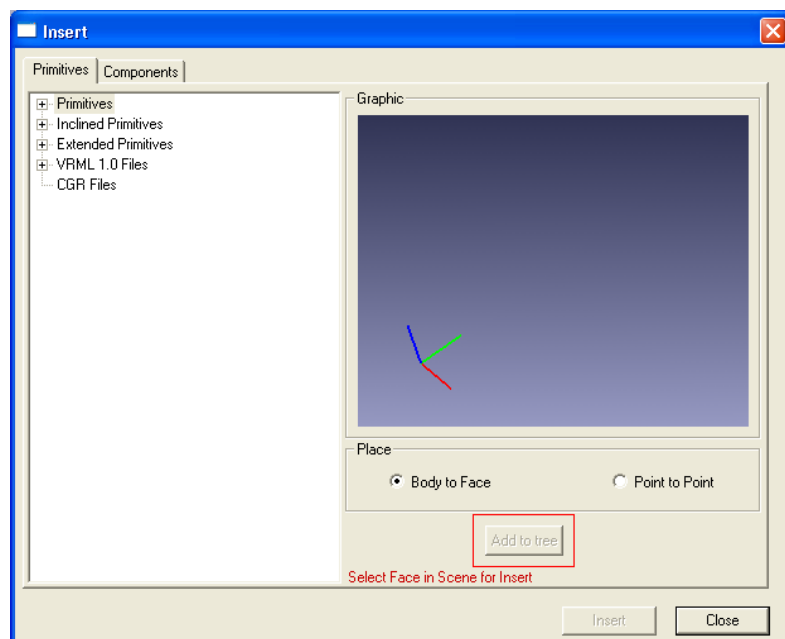


Figure 170: Insert Tool of WSC Graphic Editor

4.6 Autorelations in the Layout

Autorelations are automatic assignments of technical objects (for example resources: parts bins) to organisational objects based on existing relations between:

- Processes and resources
- Processes and products
- Products and resources

Autorelations are used to facilitate and accelerate your work.

- With the help of autorelations, for example, a parts bin is visualized with position data in a process (synchronization). If this parts bin is linked to the product as well, it is placed in the layout without a separate entry in the bill of materials.
- Defined settings have to be made in the DELMIA Process Engineer configuration. These are usually preset in the case of the standard plantype set.

Example

A prerequisite of the standard plantype set is that all necessary links exist. This is done in the following way in the PPR Navigator: 1. Link process with resource, 2. link process with product and 3. link product with resource.

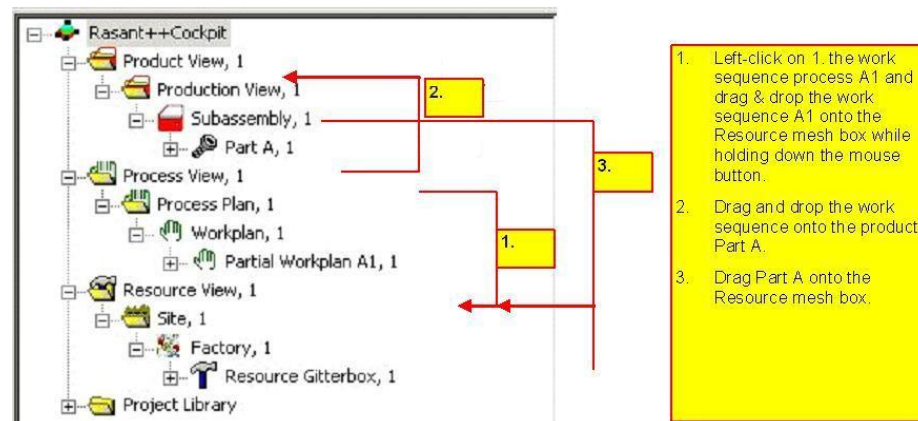


Figure 171: PPR Navigator Structure

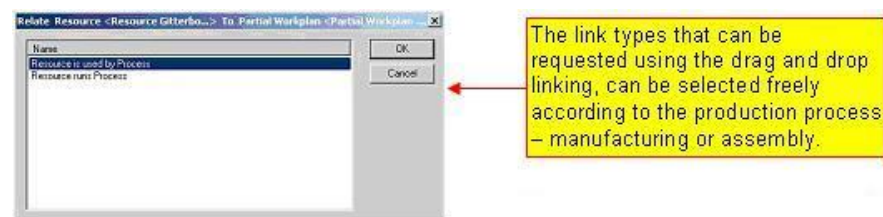


Figure 172: Process – Resource Link Type

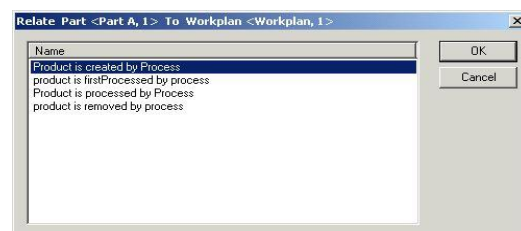


Figure 173: Product – Process Link Type

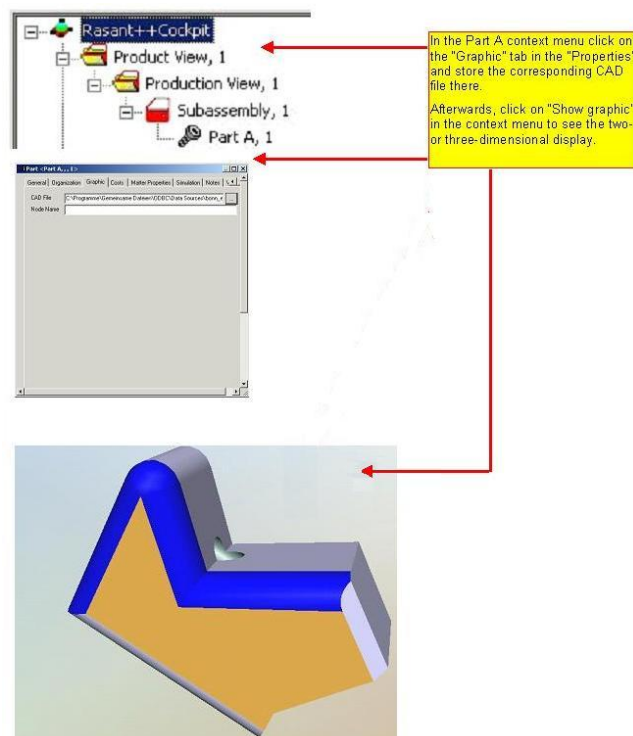


Figure 174: Stored Graphic of the Product "Part A"

**Note**

The product (Part A) is used in relation to the autorelation only for the visualisation of the stored CAD file.

In the Resource Properties dialog you can define the Resource coordinates in the **Graphic settings** tab. The coordinates are retained later, when the resource is placed in a station or a balancing tool.

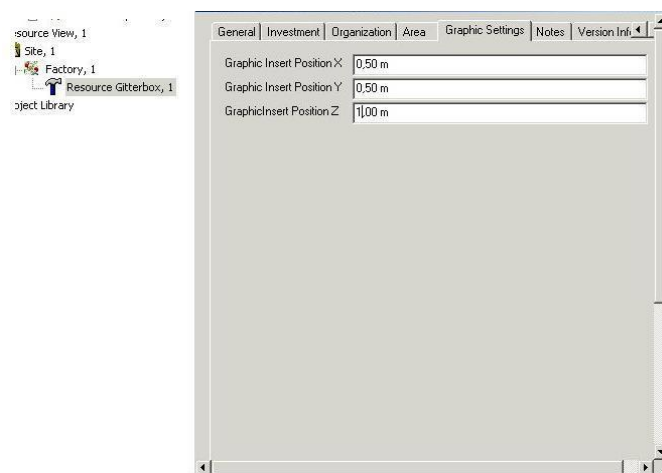
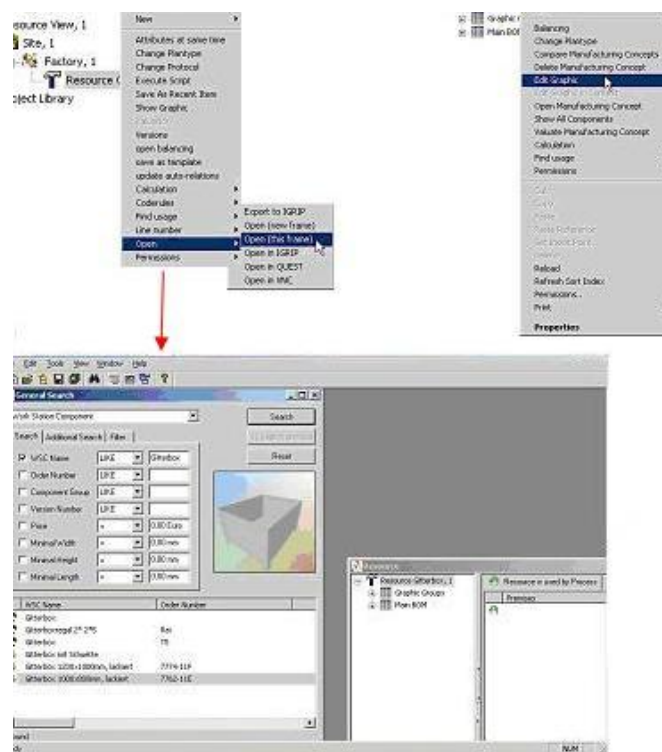
Example

Figure 175: Resource Graphic Settings

- 1) Open the resource using the **Open this frame** menu item in the context menu. Select **Edit graphic**.



Open the "Finder" (binoculars) and drag & drop the desired mesh box in the bill of materials (MBom) or directly in the layout of the Resource.

Figure 176: Resource and Linked Product

Example

Resource with linked product.

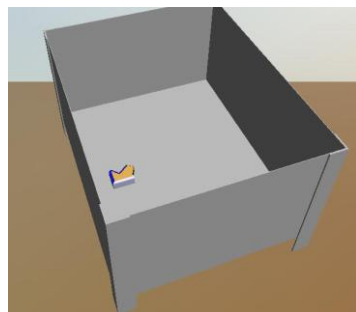


Figure 177: Resource Mesh Box with Linked Product

Now the linked product can be positioned in relation to the resource in the started **Edit graphic** menu.

You cannot execute the positioning in the station or the balancing tool.



Note

In Figure 114 you can see the visualisation of the product only via autorelation. The product is not available in the bill of materials and has not been positioned directly in the layout either.

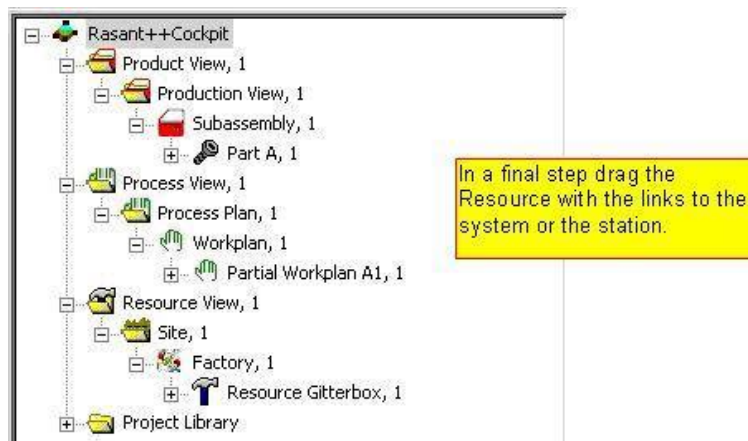


Figure 178: Linking of Resource with System or Station

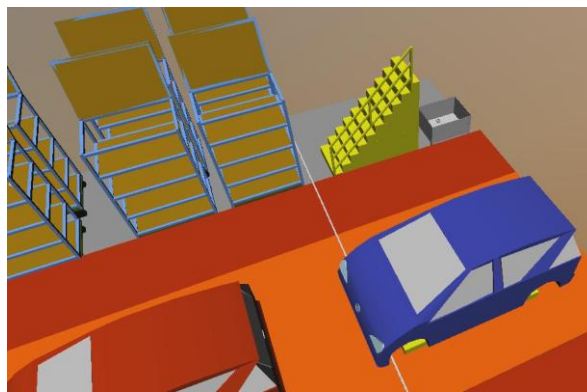


Figure 179: Station with Resource and Product (autorelation)

A tab called “Auto2_reverse” is created in the bill of materials. You can see the existing autorelation.

Product is provided by Resource		Auto2_reverse	General
Component Name	Number		
Resource Gitterbox	New Plant		
Station	New Block		

Figure 180: “Auto2_reverse” Tab Showing the Autorelation

4.7 Shortkeys for Graphic, Selection, and Navigation

Overview of
short keys
for editing
graphics

Hotkeys, Selection and Navigation in 3D layout/3D Editor

In the case of hotkeys the standard/default settings are underlined; if there are no default settings, the standards are taken from the Properties menu.

Table 2: Shortkeys for Editing Graphics

Short Keys	Description
'a', 'A'	View All
'g', 'G'	Grid On / Off
'l', 'L'	Lock Axis On / Off
'q', 'Q'	<u>Perspective</u> / Orthographic camera mode
'f', 'F'	Render <u>Faces</u> / Wire / Boundingbox
's', 'S'	Stereo mode On / <u>Off</u>
't', 'T'	Text On / <u>Off</u>
'u', 'U'	Transparency On / <u>Off</u>
'w', 'W'	<u>Examine</u> / Walk navigation mode
'z'	Zoom out
'Z'	Zoom in
'1'	<u>3D view</u>
'2'	2D front view
'3'	2D left side view
'4'	2D right side view
'5'	2D back view
'6'	2D top view
'+'/'-'	after zoom operation with magnifying glass Next / Last view

Overview of
short keys
for editing
graphics

Table 3: Standard Windows Accelerator Keys Table

Keys	Description
CTRL-A	Select All
CTRL-S	Save
CTRL-Y	Redo
CTRL-Z	Undo
Left-click	Selection
CTRL-Left-click	Multiple selection (left-click to add or remove a selection)
CTRL-SHIFT and Left-click	Centring part of a graphic
Mausrädchen	Zoom
SHIFT-Left mouse button	PAN-Mode

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