

DESKARTES



INDUSTRIAL DESIGN SYSTEM

UPDATE NOTES

CHANGES FROM VERSION 4.4 TO 4.5

Update Manual

for the release of DESKARTES v. 4.5, March 2005.

Copyright

© 2005 DESKARTES Oy. All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language in any form by any means without the written permission of DESKARTES Oy.

DESKARTES Oy reserves the right to revise this publication and to make changes from time to time without the obligation to notify any person of such revisions and changes.

Trade Marks

DESKARTES and the DA symbol are trademarks of DESKARTES Oy. Other brand and product names are trademarks and registered trademarks of their respective owners.

Credits

Written by Ismo Mäkelä and Jukka Malmivaara.

Address

DESKARTES Oy
Pihlajatie 28
FIN-00270 Helsinki
Tel. +358-207-414510
Fax +358-207-414515

Table of contents

<i>Table of contents.....</i>	<i>i</i>
<i>Foreword.....</i>	<i>1</i>
<i>New Functionality.....</i>	<i>2</i>
<i>Creating 2D technical drawings.....</i>	<i>2</i>
<i>New command DIMENS⇒ 2D Drawing: Generate.....</i>	<i>3</i>
<i>Selecting views and measurements.....</i>	<i>3</i>
<i>Measurement functions.....</i>	<i>4</i>
<i>Printing, Saving and Viewing functions.....</i>	<i>6</i>
<i>2D Drawing information.....</i>	<i>7</i>
<i>New command DIMENS⇒ 2D Drawing: Open.....</i>	<i>8</i>
<i>New command DIMENS⇒ 2D Drawing: Settings.....</i>	<i>8</i>
<i>Soft shadows in ExTrace.....</i>	<i>10</i>
<i>ExTrace lighting models.....</i>	<i>11</i>

Foreword

This Update Manual describes the changes of the *DESKARTES Industrial Design System* from the release of version 4.4 in November 2003 to the version 4.5 in March 2005.

New functionality has been implemented in particular in the following areas:

- Creating 2D technical drawings
- Soft shadows in ExTrace

Only those functional changes are reported that significantly change the operation or add new features to the system. Additionally there are some bug fixes and other improvements, which are not mentioned separately.

New Functionality

Creating 2D technical drawings

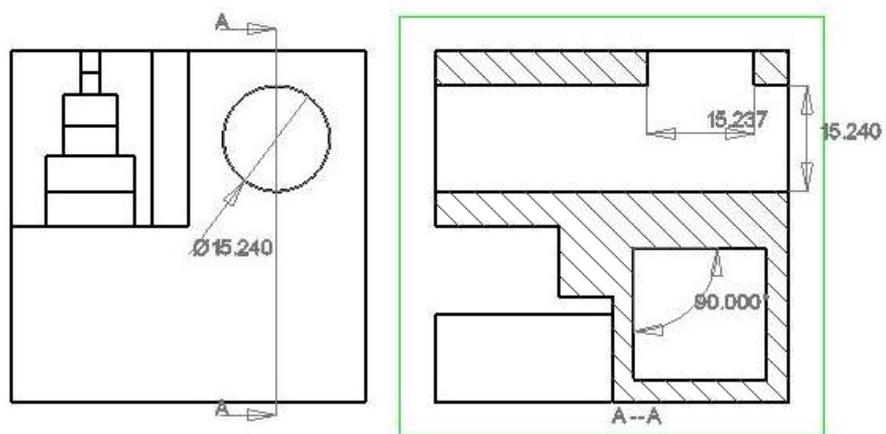
2D Drawings allow you to generate accurate and professional 2D drawings from STL and surface data. The system searches different features in the CAD model (faces, cylinders, curved areas etc.) and displays the feature edges and silhouette curves for subsequent measuring in a separate 2D drawing window. Drawing window is a 2D representation in a form of normal A4, A3 etc. paper size. It includes necessary header information along the drawing and it can be printed on a normal printer or saved for later examination and measuring.

The user can either

- Generate new drawing or
- Open an existing drawing

The Generate command creates a drawing from a selected model in the Model Tree. This sets the 2D Drawing in **Create drawing** operation mode. The Open command opens an existing DeskArtes 2D Drawing file (.dad) for measuring and sets the drawing into **Measuring mode**. In the Measuring mode section and new view generation is disabled.

An example view of a 2D Drawing:



New command *DIMENS* ⇒ 2D Drawing: Generate

First select the STL or surface model from which the drawing is generated. After the Generate command the model is processed to find the features. This may take some time with large models. Also, if a surface model is selected a temporary triangle representation is automatically generated before going into the 2D Drawing generation. After the initial processing wanted basic views (front, back, left, right etc.) are displayed to the user. Selecting basic views is done through the **Drawing Settings** window.

After the preprocessing the user can add measures, balloons and annotations to the model. The model can also be sectioned with user selectable section lines either in x or y direction. The user can also **Open** existing drawings for adding and deleting measures and annotations.

After the features are found from the model the selected views are displayed on the white paper background. Several commands are given in two different toolbars. These commands are divided into commands to generate the measurements and commands to control the display, print and setting for the 2D drawings.

Selecting views and measurements

The basic state for the 2D drawing generation is the **selection state**. In this state you can select views and measurements with the left mouse.

One view always needs to be **selected** as an active view for the subsequent measurement commands. This is done by clicking the wanted view on the 2D drawing display with **left mouse button**. The selected view is indicated with a green frame around the view window.

Individual measurements are done by **selecting points** in the drawing data with the **left mouse button**. Each selected point is indicated with a red arrow. Different commands require from one to three points to be selected. After the measurement is done the position of the indicators are normally set by **dragging with the left mouse button down**.

You can **select** an existing measurement by clicking it with the **right mouse button**. Selected measurements are shown with a blue frame and can be deleted or edited.

Cancelling a measurement in progress is done by clicking with **the right mouse button**. This returns the drawing generation into selection state.

Dependent views are views which must lay at fixed x or y level when compared to each other. For example, front and left views must lay on the same y level at all times. Also, a section view is dependent on the originating view. EU/US standard views depend on each other.

When inserting new views with the Insert view command into an existing drawing the new views are not dependent on other views and can be moved freely.

Measurement functions



This function generates the bounding box size information around the selected view. After the command you must first position the vertical measure by clicking and dragging with the left mouse. After releasing the mouse the vertical measure is fixed. Then do the same for the horizontal measure.



This function generates a section view through the selected view. First use right mouse to select the initial position of the section line. Then give the section line direction (x or y axis) with the second left mouse click. Third click will start the dragging of the section line on top of the view. Fourth click will select the side to choose for the section view. Section view command can only be used in the **Create drawing** mode.



Shows the horizontal distance between two points. First select the two points on the data, third click will start the dragging for the indicator position.



Shows the vertical distance between two points. First select the two points on the data, third click will start the dragging for the indicator position.



Use this command to mark the center of a circle for subsequent measurement operations. Select three points from the circle perimeter with the left mouse.



Shows the diagonal distance between two points. First select the two points on the data, third click will start the dragging for the indicator position.



Shows the diameter of a circle or a hole. Select three points from the circle perimeter with the left mouse. In the fourth step you can drag the indicator position by clicking and keeping the left mouse button down.



Measure the angle between three points. First click selects the starting point for the start edge, second click selects the middle point and the third will select the end point of the second edge. In the fourth step you can drag the indicator position by clicking and keeping the left mouse button down.



Gives the radius of a rounding. Select three points from the rounding perimeter with the left mouse. In the fourth step you can drag the indicator position by clicking and keeping the left mouse button down.



Marks the selected point with a balloon. Second left click will allow you to start dragging the position for the balloon while keeping the mouse down. Later you can identify the balloon by adding an indicator letter or number inside the balloon with the text annotation command.



Starts the drawing header editor dialog. You can add your company data and other information into the header section in the right bottom corner of the drawing.

The edited header can be saved as a default header by pressing **Save as default** in the header dialog. The default header is loaded when starting a new drawing.

The dialog also has two no editable entries, i.e. the **scale** used in the drawing and the selected **paper size** (you must not scale the printed drawing anymore).



Starts the Edit box for creating free annotations in the drawing. After pressing OK in the Edit box you can position the annotation by dragging with the left mouse down.



Insert new basic view to the drawing. The view is selected with the View type dialog. This command can only be used in the **Create drawing** mode. You can move a new basic view freely on the drawing area.



Edit the annotation or measurement text after selecting it with the right mouse button.



This function deletes the selected view (currently there is no undo).



This function deletes the selected measurement (currently there is no undo)

Printing, Saving and Viewing functions

Some of the viewing functions can be use while in process of adding a measurement and before positioning the indicator. This allows you to zoom in the details for accurate point selection as well as comfortable indicator positioning. These commands are marked with "*This command can be used while generating a measurement.*"



Open an existing drawing.



Save the current drawing.



Print the current drawing.



Move the current view horizontally. Dependent views will move along the current view. If the current view is the last added view and a section view only the this view is moved horizontally.



Move the current view vertically. Dependent views will move along the current view. If the current view is the last added view and a section view only the this view is moved vertically.



Open the 2D Drawing Settings window. Changing some of the settings will affect the drawing immediately (show grid, hidden, hatch ...)



Toggle grid on/off.



Fit the current view on the drawing area. *This command can be used while generating a measurement.*



Fit the paper on the drawing area. *This command can be used while generating a measurement.*



Pan the view by clicking with the left mouse button at any point on the screen, then move the cursor to the new location of the first point, and release the button.



Drawline pan.



The view will change continuously if you press the left mouse button whilst moving the mouse.



To zoom in freely by a view box, press and hold the left mouse button with the cursor at the center of where you want to zoom. Move the mouse up or down and a rectangle showing the new window is displayed. The window is fixed by releasing the mouse button.



By clicking the right button, the window becomes half the size it currently is - the objects on the screen are shown bigger. *This command can be used while generating a measurement.*



By clicking the right button, the window becomes twice as big as it currently is - the objects on the screen are shown smaller. *This command can be used while generating a measurement.*



This function finishes editing the measurements without saving anything.

2D Drawing information



Information dialog shows

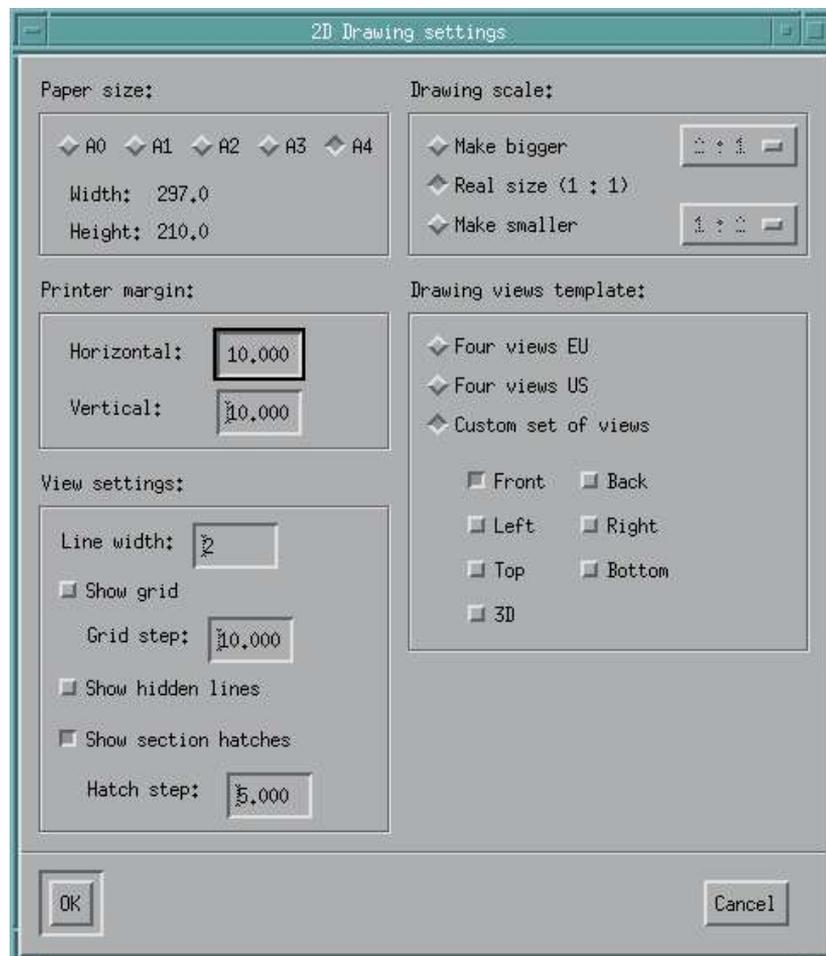
- **Operation mode:** Create drawing or Measure drawing. Create drawing allows you to use all measuring commands, Measure drawing mode does **not** allow you to use Section and Insert View command.
- **Selected view:** Front, back, left, right, top, bottom or 3D. For section views either Vertical view or Horizontal view.
- **View extents:** Extents of the currently selected view.
- **Command help:** Left hand text field. Gives help for the next mouse operation for the command.
- **Mode:** Right hand text field. Select mode or different command mode. When in select mode you can select objects from the drawing, when in command (Distance, angle, etc.) follow the instruction on the left hand text field.

New command DIMENS⇒ 2D Drawing: Open

Opens an existing 2D drawing for editing. Operation mode is Measure drawing which allows you to use all measuring commands except generate section views or generate new basic (front, back, left, right etc.) views.

New command DIMENS⇒ 2D Drawing: Settings

The 2D drawing command initial views (EU, US, front, back, ...), paper size, paper margins etc. are controlled by the 2D Settings dialog.



Paper size

This section allows you to define the paper size for the drawing. The size of the paper is indicated in millimeters.

Printer margin

This section allows you to set the width of the non usable area in millimeters at the edges of the paper. This depends on the printer you are using.

View settings

This section allows you to control the special effects on the display and on the printed drawings:

- **Line width:** Set the line width for model drawing lines. Affects both 2D Drawign display and printing.
- **Show grid and grid step:** generate a grid on the paper with wanted step size.
- **Show hidden lines:** display the hidden lines on the paper
- **Show section hatches:** display even hatching showing the cut area in the sectioned model view (we recommend you to keep this on).

Drawing scale

Allows you to select a wanted scale for you drawing. You might need to scale down a large part to fit it into a paper or you might want to scale up a small part to be able to see the details in a printed drawing. The selected scale is always printed with the drawing. Scaling can only be done before adding any measurements into the drawing.

Drawing views template

This section allows you to select the different views which are generated when 2D Drawing/Generate command is given:

- **Four views EU standard:** generates four views according to the European standard
- **Four views US standard:** generates four vies according to the US standard
- **Custom set of views:** allows you to select the views you want to generate

Some views depend on each other, i.e. they need to lay on same x or y level when compared to each other. These dependencies are kept automatically when you are positioning the views on the paper. All views can be used as a starting point for a section view.

Drawing views must be selected before the Generate command. New views can be inserted with Insert view command when in **Create drawing** mode.

Soft shadows in ExTrace

There is a new parameter in the light properties, which allows you to set the light to produce soft shadows in ExTrace.

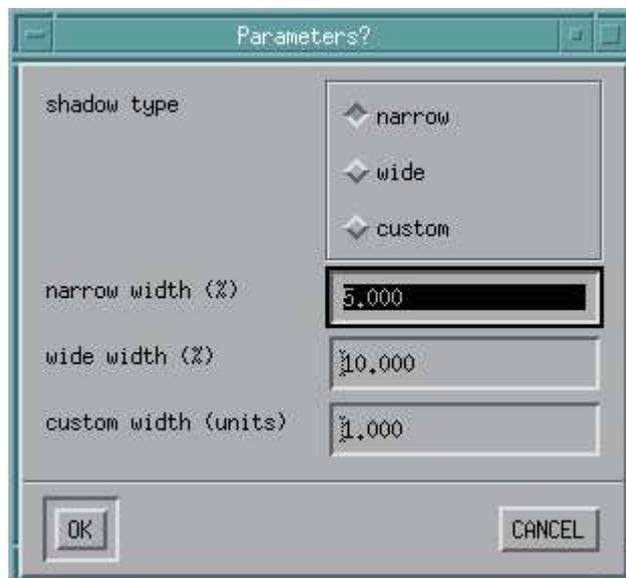
The light properties are changed in the scene editor (DIMENS⇒ Edit: Lights). First you have to select the light source and then the light properties command.



The light properties dialog is shown



If you select the soft shadows, then a separate dialog is shown to set the parameters for controlling the soft shadows.



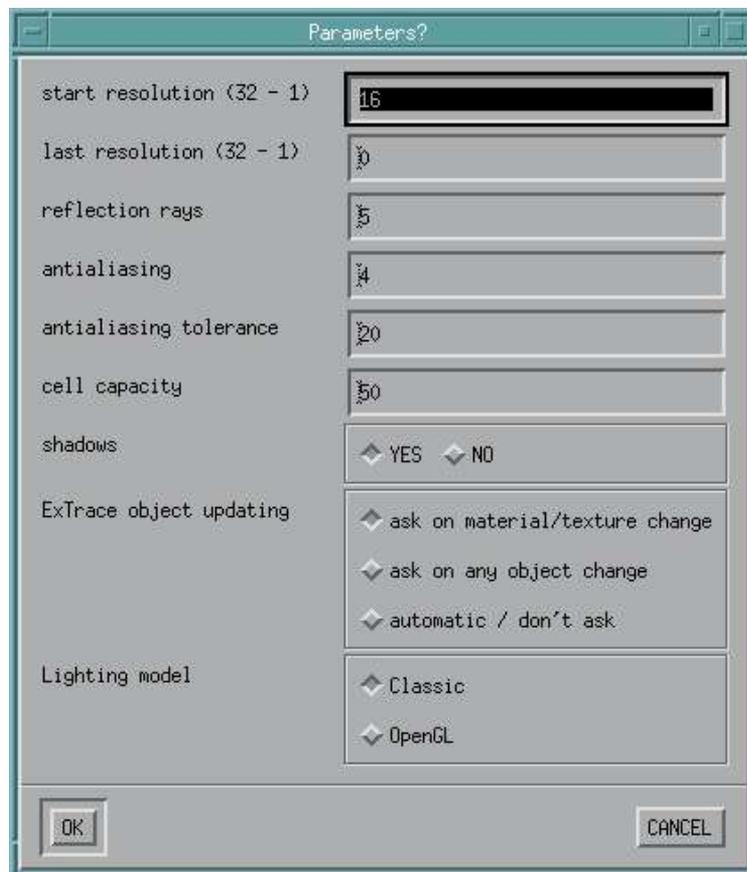
The size of the light source can be selected as **Narrow**, **Wide** or **Custom**. With wide and narrow you can set the size as the percentage of the whole model size ("universe"). The custom size is specified directly in the same units you are working in with the model.

Note: Currently the soft shadows are only shown when the OpenGL lighting model is used in ExTrace. (*See the ExTrace lighting models below.*)

ExTrace lighting models

In ExTrace you can now choose between two lighting models, which produce different results with the same light and material settings.

The lighting model is chosen in the ExTrace general settings dialog (EXTRACE⇒ Prefs: General).



The **Classic** lighting model is the traditional ExTrace lighting model used in the previous versions (4.4 or older) of DeskArtes IDS. When creating ExTrace images of models originally created with older IDS versions, you should choose this lighting model.

Otherwise you might need to redefine some light and material definitions.

The **OpenGL** lighting model uses common lighting calculation formulas with the OpenGL rendering. Therefore the resulting ExTrace image should be more similar to an OpenGL image, rendered using the same material and light definitions.