

KISSsoft AG - ☎ +41 55 254 20 50
Uetzikon 4 - 📠 +41 55 254 20 51
8634 Hombrechtikon - ✉ info@KISSsoft.AG
Switzerland - 🌐 www.KISSsoft.AG

KISSsys Instructions:

Graphic Elements in KISSsys

1 Introduction

This instruction guides the user in the manipulation of the 3D Representations of a KISSsys model. The development of KISSsys provided a small feature, the 3D Representation, which is a very useful feature to visualize the KISSsys Model. It is possible to manipulate the 3D Representation with several commands. It allows the effective control against collision of the system components. This instruction will show how to setup 3DView appearance and how to use the dialog to do the most important settings.

The tools presented in this instruction are not only interesting from the technical aspects; they are interesting for the visual aspects as well. That can be highly important when the model is used in a presentation before a critical client, who does not know what was calculated but who can see nice pictures and will be far more impressed by that fact.

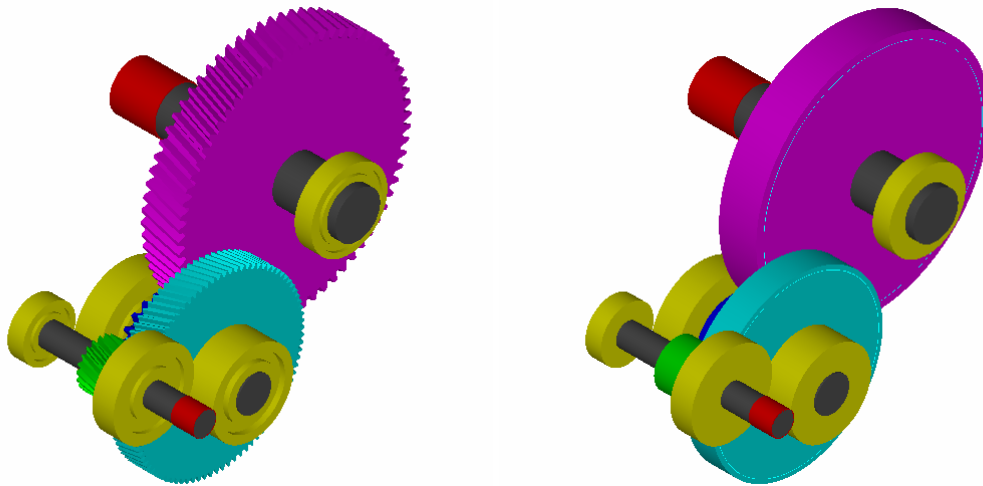


Figure 2.1-1 Graphical presentation of the model

2 Solution

2.1 Colors

It is possible to change the colors of each gear and other components to make a visual difference between them. The next step would be the definition of the transparency of the components which are covering possible collision areas. If it is not possible to decide if there is a collision in the model or not KISSsys provides a function which checks the model for collision. It is also possible to check for collision with casings.

2.2 Colors

The original representation of a model is always done in the default colors at the beginning. (gears as blue, bearings as yellow, couplings as red and shafts as grey). It is possible to change the color of the different elements independently. This is done by the function “SetColor” under tree structure of each component.

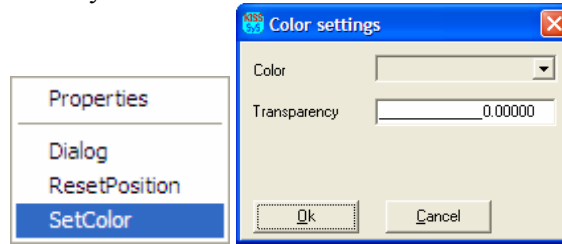


Figure 2.2-1 Color and transparency setting for a single component

Using the function will show a dialog to make a selection for the color. Select desired color from the list. User may also set the transparency of the component with same function. Transparency 0 means solid element and 1 means invisible.

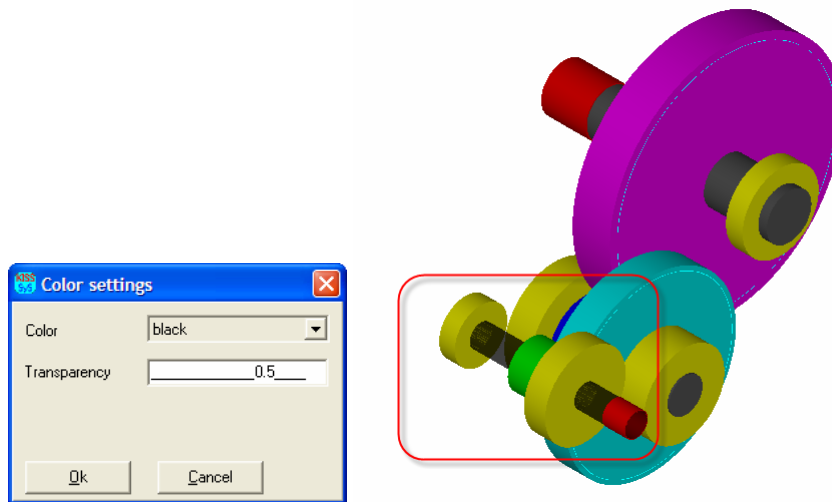


Figure 2.2-2 New settings are visible in the 3DView

At the same time new variables “kSys_3DColor” and “kSys_3DTransparency” are automatically created for the component defining new color and transparency for the component..

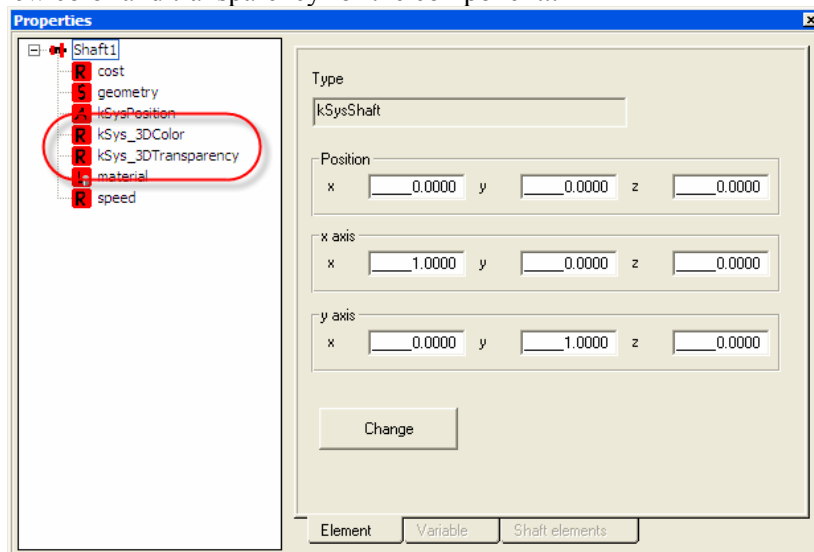


Figure 2.2-3 Variables for the color and transparency

2.3 Transparency

The definition of the factor of transparency “kSys_3DTransparency” defines how transparent an entity is. This can be helpful to see what happens behind an element. This variable can be efficiently be used in cases when there maybe risk of collision or user wants to see “inside” the element. The value of the variable which shows an effect goes from 0 to 1, where 0 is non transparent and 1 invisible. It is possible to check for collision after clicking on “Refresh All”. The transparency can be applied for every element which can be represented in 3D.

3 Set representation modes

3.1 SetRepresentationModes – function

There is available a function under “System” which can be used to set up 3DView components efficiently.

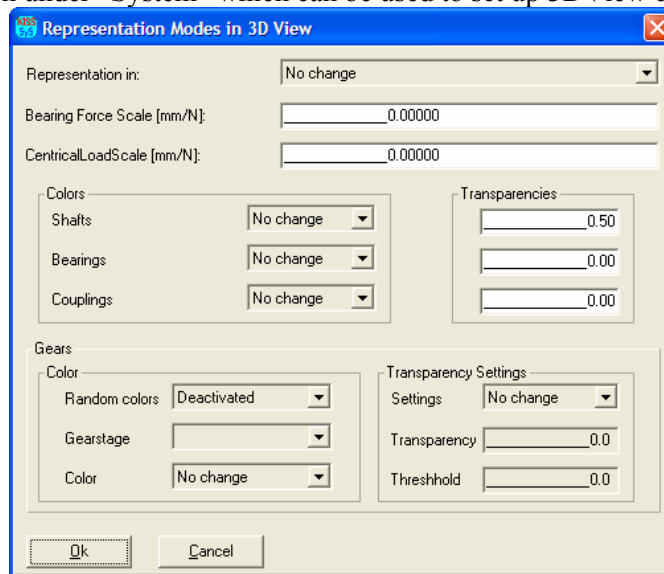


Figure 3.1-1 3DView setup dialog

3.2 “Representation in”

“Graphic Elements” shows only the “rough” shapes of the gearbox entities. This kind of representation is in most cases enough exact to discover collisions and needs not a lot of refreshing time. The tip diameter is the outer diameter for the representation of the spur and helical gears. The cyan colored circle is the root diameter.

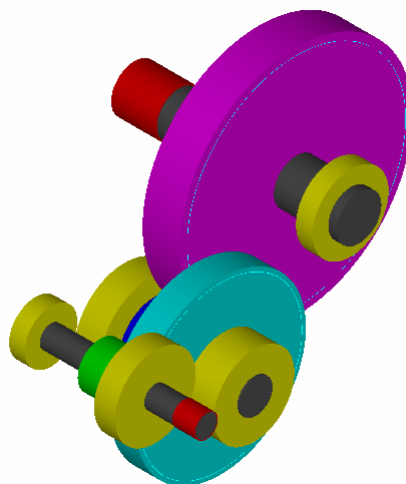


Figure 3.2-1 Model with graphic elements

“Solid Elements“ represents the geometry more detailed. The tooth geometry for example is shown in a simplified form as triangles not in exact tooth forms. This setting needs a lot of refreshing time and even more time to start the model. It should only be chosen if the model has to impress other people, or if the collision check has to be made. This representation can also be very helpful to control the helix angle on gears. The teeth of bevel gears cannot be displayed.

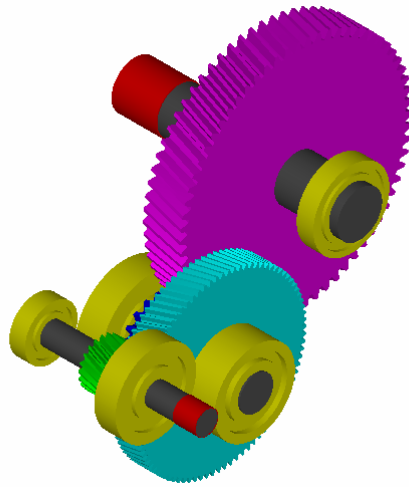


Figure 3.2-2 Model with solid elements

3.3 Force presentation

It is possible to show radial components of the forces in the 3DView. Choose desired scale [mm/N] for the forces to be visible. If scale is let to be zero, then force magnitude is not shown. Forces from the bearings and supports are shown in red and forces from the “kSysCentralForce” components are shown in green. Direction of the force in the space can be easily checked with this functionality.

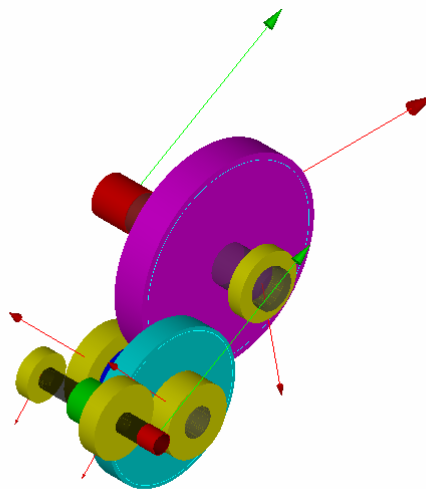


Figure 3.3-1 Presentation of the external and internal forces

3.4 Component colors

If all components (shafts, bearings or couplings) are preferred to see in same color and same transparency it can be easily made choosing desired values in the dialog. This can be made in the middle part of the dialog.

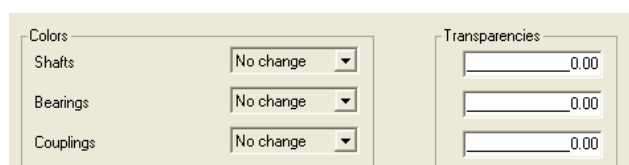


Figure 3.4-1 Component settings

3.5 Gear colors

Gear colors can be selected to be random (Activated) when gear colors are selected automatically. Single gear stage colors can be selected from the list choosing first the gear pair and selecting then color from the list. Gear transparency settings can be made according to three methods.

Power flow sets selected transparency for all components which are not loaded given "Threshold" value is used to check power flow. If power on the component is lower than "Threshold" it will become transparent.

Fixed single stage, if "Gearstage" is selected transparency is set to that pair.

Fixed all stages makes all stages solid.

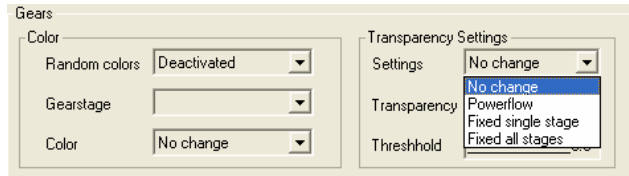


Figure 3.5-1 Gear settings

4 Collision Check

KISSsys has an automatic collision check, which only works in the graphical setting „SolidElements“ and needs some time to calculate. It is not possible to check by manually, if there is a collision between Gear1 on the intermediate shaft and the bearing. In this case, it makes sense to check automatically for collisions.

4.1 Using the Collision Check

A right click on "kSys3DView" and the choice of "CheckCollision" leads to the activation of the following dialog:

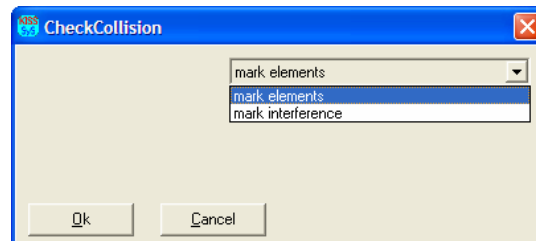


Figure 4.1-1 Collision check dialog

It is possible to choose in the drop down menu either if the elements in collision ("mark elements") or the surfaces which are interfering ("mark interference") are marked. After clicking on "Ok" KISSsys launches the check. If there is NO collision it happens nothing after a small calculation break. If there is collision it shows the interfering elements or surfaces in green colors and slightly transparent:

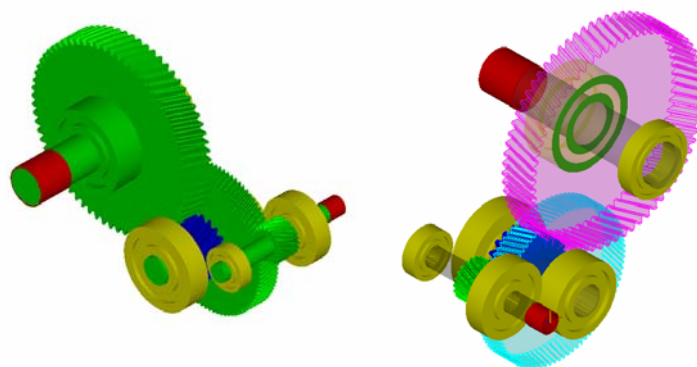


Figure 4.1-2 Left: "mark elements" possible collision shown in green color
Right: "mark interference" possible collision marked with green color

The model reappears with a click on "Refresh All".