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

KISSsys Instruction:

Positioning

1 Introduction

The machine elements have to be positioned correctly in the space, to assure a correct positioning of the forces and for the 3D representation. This instruction should explain how to position the most important elements.

2 Summary

There are two kinds of positioning procedures: the positioning of the shafts in the three dimensions and of the machine elements on the shafts. Every KISSsys Element can be positioned in space according to the parent element. This method is not very user friendly and should be avoided. Although at the moment it is the only possibility to position a casing in a model.
It is either possible to define parallel orientation of two shafts or to define the position with the tooth meshing of e.g. worm or bevel gears. Elements can be moved on the parent shaft either by drag and drop in the shaft editor or by using the variable position.

3 Positioning of the Elements

The methods of positioning the elements in KISSsys can be divided in three parts.

3.1 Simple Positioning

Every KISSsys element (e.g. a casing) can be positioned in the room related to the parent object (e.g. a group). The position is shown in the properties dialog of the element. It is also here were it can be changed. A right click on the element and the choice of “Properties” shows the following dialog:

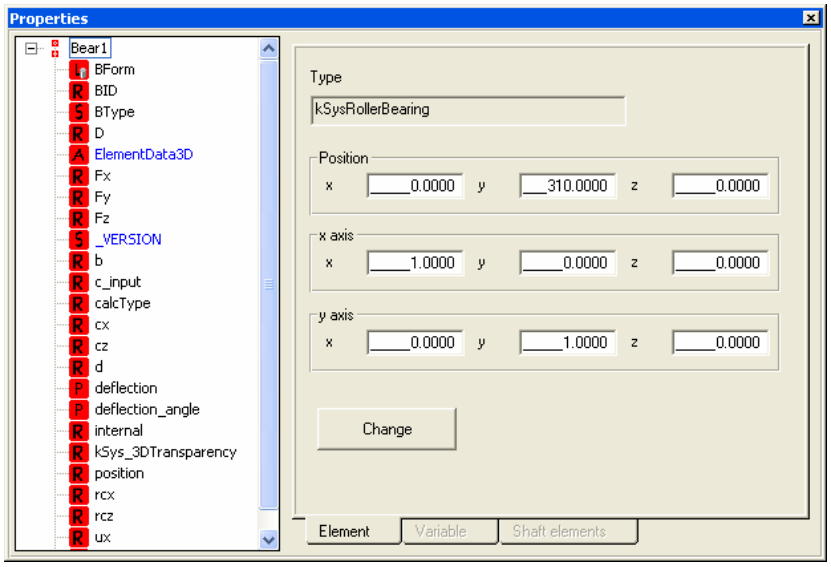


Figure 3.1-1 Positioning with the Properties

The Cartesian coordinates can be given in the „Position"-fields of the „Properties". The reference is hereby on the coordinate system of the parent element (e.g. the group). The orientation of the coordinate system is given in normal vectors; they show the directions of the x- and y-axis. In the example is Bear1 310mm displaced on the positive y-axis of the parent element. The directions of the x- and y-axis are identical to the directions of the coordinate system of the parent (x-axis=[1,0,0], y-axis=[0,1,0]).

3.2 Positioning of the Shafts

All elements situated on a shaft, can be moved in the y-direction of it. Every element except for the shafts contains the variable „position", which defines the position of the elements on along the positive y-axis (orientation of the element = orientation of the element).

3.2.1 Example

Right click on the element to position („Bear1") -> Properties -> position -> enter the value for the position in „Value".

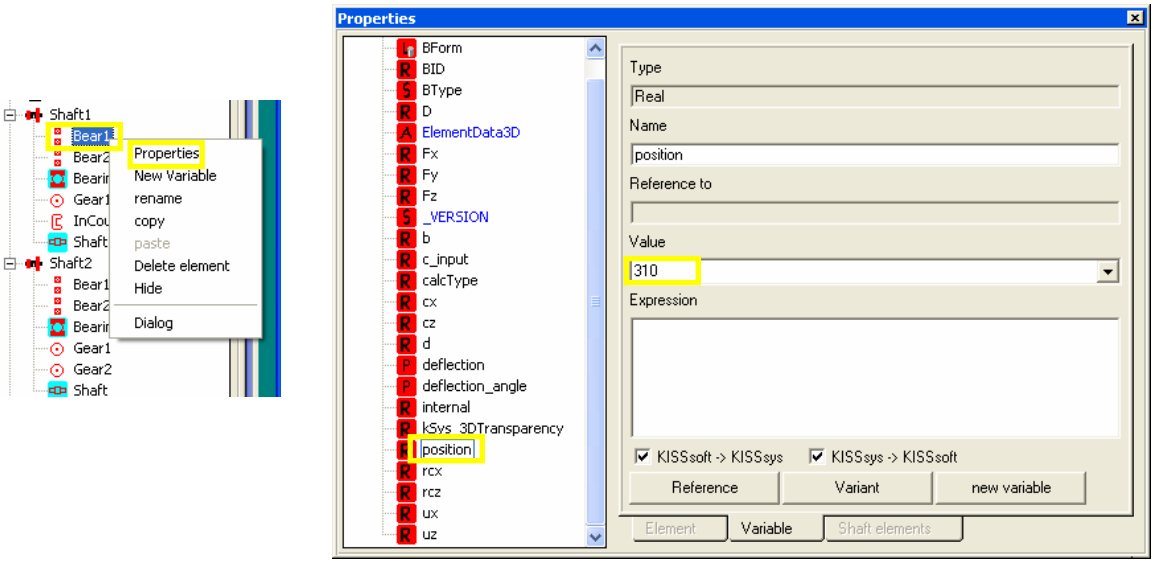


Figure 3.2-1 Procedure to Position Elements on Shafts

The changes are visible in the 3D representation window after doing a „Refresh All".

Hint: Elements can also be positioned by "Drag and Drop" in the graphical shaft input of the KISSsoft shaft module. Using the graphical editor is usually easier to position elements directly in the correct place on the shaft.

3.3 Positioning of Shafts

The position of a gear boxes elements are in the majority defined by the placement of the shafts. Due to that reason pre-programmed functions make the positioning of these shafts easier. A right click on the shaft and the choice of "Dialog" shows you positioning window, which contains 5 positioning functions.

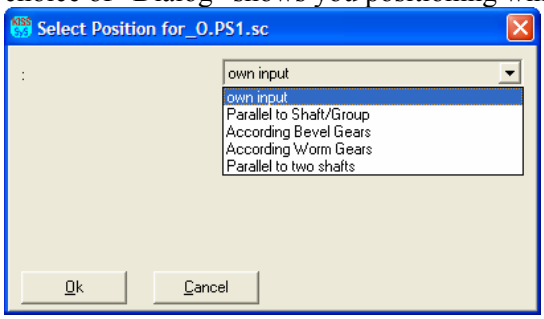


Figure 3.3-1 Positioning functions for a shaft

3.3.1 Own Input

"Own Input" is the command which activates the positioning described in the chapter 3.1.

3.3.2 Parallel to Shaft/Group

This command allows the positioning of a one shaft parallel to another. With the choice of this command and the click on „Ok" opens the following dialog for the positioning:

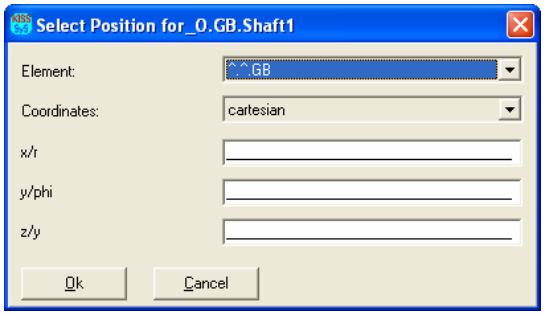


Figure 3.3-1 Parallel to Shaft / Group Dialog

Input	Function
Element	Selection of the reference element for the positioning.
Coordinates	Indication if the positioning is made in Cartesian or polar coordinates.
x/r	Cartesian x / Polar r (Radius)
y/phi	Cartesian y / Polar Phi (Position angle measured from x-axis)
z/y	Cartesian z / Polar y

As the name indicates it, it is possible to take also a group as a reference. The y-axis of the shaft or the group which has to be positioned is then set parallel to the y-axis of the reference shaft or group.

3.3.3 According Bevel Gears

This is the command for the orientation of the shaft according the tooth contact between bevel gears. The necessary data is entered in the following dialog:

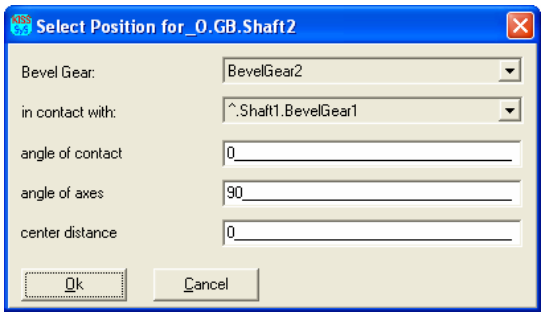
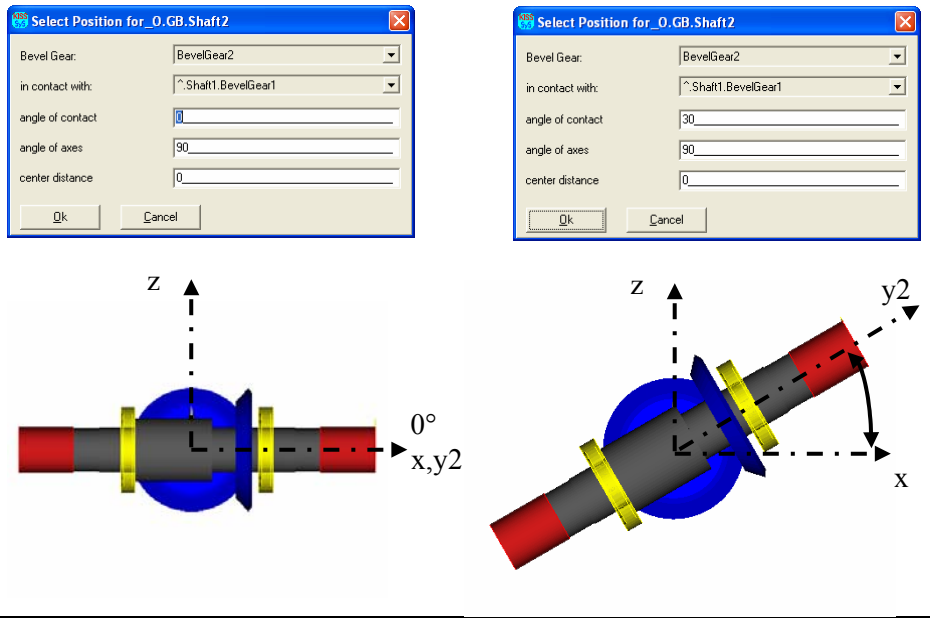
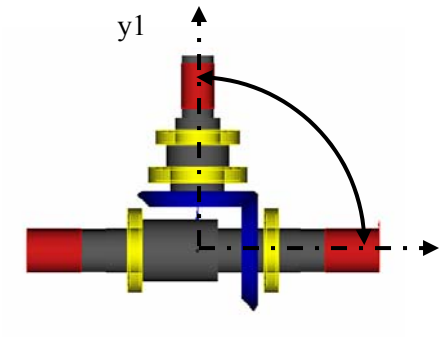
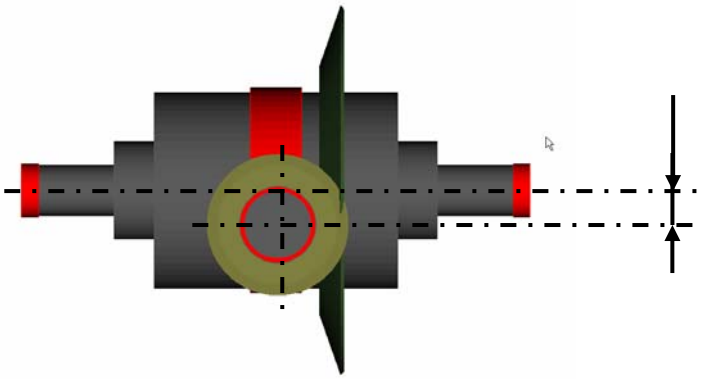


Figure 3.3-3 Positioning according Bevel Gears

Input	**Function**
Bevel Gear	The gear which has to be oriented
In contact with	The fixed gear
angle of contact	Defines the angle between the y-axis of the bevel gear and the positive x axis of the contact gear. 
angle of axes	Angle between the two y-axis 
centre distance	Possible displacement for hypoid gears

Attention: Always differ between drive or coast side for spiral bevel gears. “Drive side running” means that the helix angle and the rotation direction of the pinion match (seen from the Tip of the cone).

3.3.4 According Worm Gears

This is the command for the positioning of a worm and its gear. The parameters for the positioning are entered as follows:

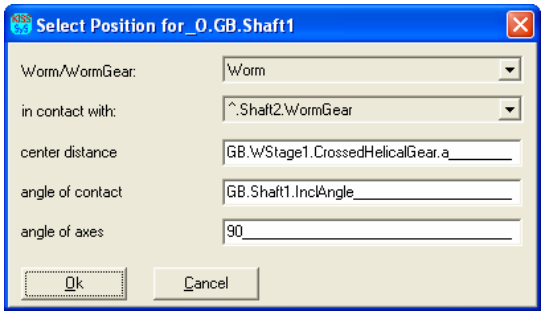
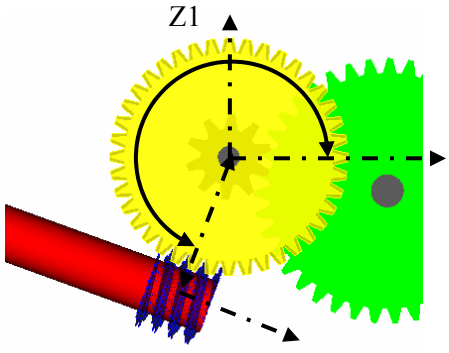
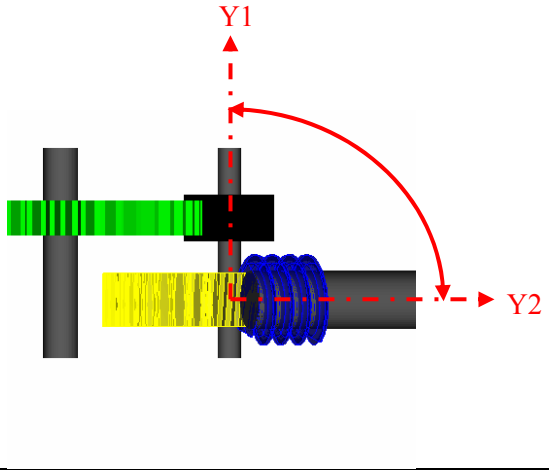


Figure 3.3-4 Positioning according Worm Gears

Input	Function
Worm/WormGear	The gear which has to be oriented
in contact with	The fixed element
center distance	Center distance
angle of contact	 Position on the circumference of the reference diameter of the “Worm/Worm Gear”.

angle of axes	Angle between the two shaft axes to each other (for crossed helical gears). 

3.3.5 Parallel to Two Shafts

This command calculates the positioning of an intermediate shaft between two other shafts.

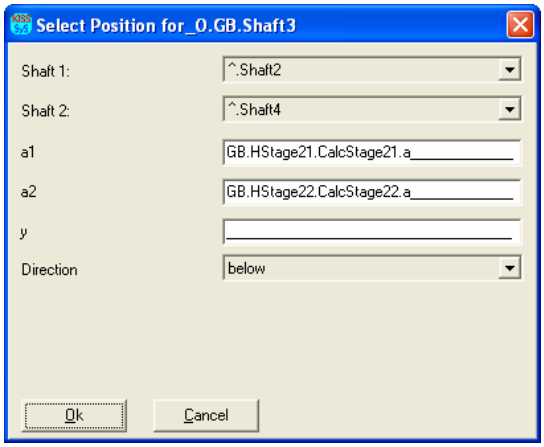


Figure 3.3-5 Positioning Parallel to Two Shafts

Input	Function
Shaft 1	First reference shaft
Shaft 2	Second reference shaft
a1	Centre distance between intermediate shaft and shaft 1
a2	Centre distance between intermediate shaft and shaft 2
y	Position of the coordinate system of the intermediate shaft, with shaft 1 as reference
Direction	Which one of the two cutting points between the two centre distances should be taken?

Attention: As soon as a positioning function is active, is not possible anymore to position the elements in their properties.