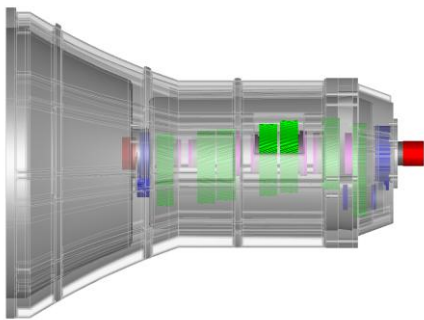


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## **KISSsys: Software Add-On for KISSsoft**

When a drive train structure gets complicated in sense of kinematic structure or variable internal power flow, KISSsys becomes a very powerful tool to handle the data, calculations and the results of the complete drive train.



### **KISSsys Functions**

Thanks to the flexibility and internal programming possibilities, customisation and adaptations for the standard calculations are possible. The user is able to define company-specific formulas for the calculations. By using a customised user interface table, the operational interface of the model can be adapted.

KISSsys may also be used to run only the simplified calculations for the selected machine elements automatically. This means that calculations are performed quickly and reliable. If strength of the parts has to be calculated, just the access to the specific KISSsoft calculation is needed.

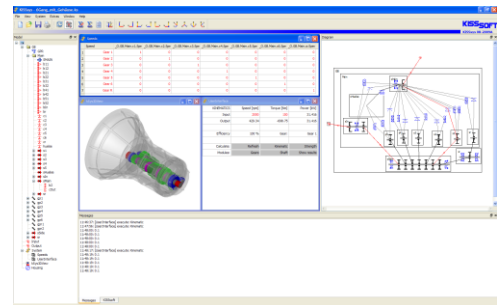
Using the connections between the elements, the power flow of the system can be modified. Afterwards, the complete vehicle gearbox can be calculated with different speed selections. The user is also able to define unlimited load spectrums in

the model – whereupon KISSsys will calculate the complete system with the user defined load cycles.

### **KISSsys Model**

A KISSsys calculation model has normally four different parts:

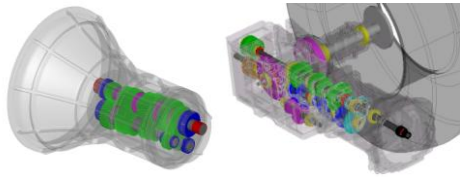
- Mechanical model including the elements and internal structure
- Kinematic calculation for load distribution in the model
- Strength calculation for the selected machine elements
- Programming language for special adaptations



The structure of a drive train can be build as a logical model, describing the mechanical elements and connections in a gearbox. This mechanical structure is utilized to calculate the kinematic of the system with the defined gear ratios and selected speed.

The user can use the access to the KISSsoft calculation interfaces to redefine the geometry, to do modifications or detailed recalculations for the singular elements. When geometrical values had been changed, these values will be automatically transferred back to KISSsys and the

effect of the changes, based on the defined geometries, gets visible directly on the 3D presentation.

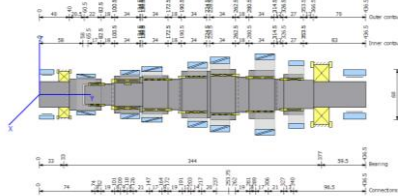


In this way, complete drive trains or part of it can be modelled. The user is also able to import housing data to check the collisions in early stage of the design. The KISSsys model, as defined, can be also exported into a CAD system.

## Vehicle calculations

When a drive train of the vehicle is modelled, the requirements for the special calculation are rather high. E.g. the following functionalities can be used to run the calculation smoothly:

- Coaxial shaft modelling for the pilot shafts, synchronizer gears or axle drive



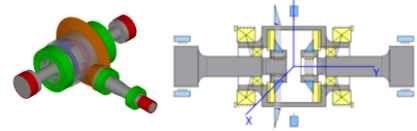
- Definition of the speeds in the drive train using a logical table

Speed	01	02	03	04	05	06	07	08	09	10
1	Gear 1	1	0	0	0	0	0	0	0	0
2	Gear 2	0	1	0	0	0	0	0	0	0
3	Gear 3	0	0	1	0	0	0	0	0	0
4	Gear 4	0	0	0	1	0	0	0	0	0
5	Gear 5	0	0	0	0	1	0	0	0	0
6	Gear 6	0	0	0	0	0	1	0	0	0
7	Gear 7	0	0	0	0	0	0	1	0	0
8	Gear 8	0	0	0	0	0	0	0	1	0
9	Gear 9	0	0	0	0	0	0	0	0	1
10	Gear 10	0	0	0	0	0	0	0	0	0

- Load spectrum calculation with consideration of the speed selections

Frequency	Torque	Speed	Gear	
1	0.05	100	3000	Gear 1
2	0.05	120	3000	Gear 2
3	0.1	150	3000	Gear 3
4	0.1	190	3000	Gear 3
5	0.1	220	3000	Gear 4
6	0.2	250	2500	Gear 4
7	0.05	220	3000	Gear 5
8	0.075	220	3000	Gear 6
9	0.175	250	2500	Gear 6
10	0.025	100	2500	Gear R

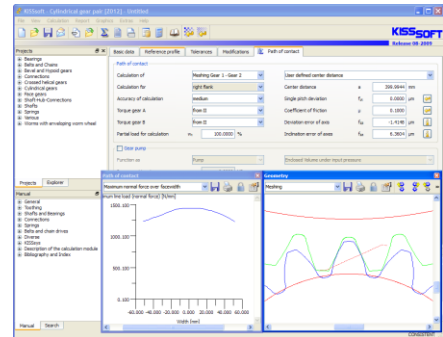
- Differential gears modelling and operation simulation



- Power split between different axles and wheels

UserInterface			
KINEMATICS	Speed [rpm]	Torque [Nm]	Power [KW]
Input	3000	100	31.416
Output_L	805.43	-176.92	14.923
Output_R	890.22	-176.92	16.493
Speed Ratio	0.95	Efficiency	100 %
Calculate:	Refresh	Kinematic	Strength
Modules:	Gears	Shaft	Show results

- Wheel slip torque definition and consideration
- CVT and hybrid drive simulations
- Efficiency calculations
- Automatic consideration of the shaft deformation in transmission error calculation



- Export and import functions to exchange result and data e.g. between KISSsys and FEM.

Find out more about our comprehensive software package for the design, analysis and optimization of machine elements. The latest version is available by download from our website [www.KISSsoft.com](http://www.KISSsoft.com).