

Comparative analysis of UM and UM Lite

General purpose	UM	UM Lite
	<p>Program package "Universal Mechanism" is a specialized CAE application that is intended for simulation of kinematics and dynamics of mechanical systems such as transport machines, road vehicles, railway vehicles, space structures, robots and manipulator, defense systems. "Universal Mechanism" supposes that its user has basic knowledge in fields of theoretical mechanics, machine and mechanism theory and mathematical modeling. Normally it is used by research engineers within research departments and offices.</p>	<p>"Universal Mechanism Lite" is a simplified version of "Universal Mechanism" software. Universal Mechanism Lite occupies a special place in the software product line of the laboratory. On the one hand, the concept of the program is the reflection of general principles laid in UM. On the other hand, functional capabilities of the program are restricted considering the specific character of this software. First of all, it is concerned the set of force elements and programming in the program environment. The program is intended for using by design engineers for express analysis of designed mechanisms in their everyday work. It does not need from the user any special knowledge and operates with well-known for any design engineer terms and ideas.</p>

Comparative table of UM and UM Lite functional possibilities

UM Modules	UM	UM Lite
<p>UM Base Base version includes the pre- and postprocessors. It is a stand-alone program package/library for KOMPAS for simulation of dynamics of mechanical systems. Use additional modules to widen its functionality.</p>	Yes	Partially supported (see below)
<p>UM Subsystems Additional module which allows describing large objects as trees of subsystems</p>	Yes	No
<p>UM Automotive Additional module for simulation of car dynamics</p>	Yes	No
<p>UM Caterpillar Additional module for simulation of caterpillar dynamics</p>	Yes	No
<p>UM Loco Additional module for simulation of railway vehicle dynamics</p>	Yes	No
<p>UM Optimization Additional module which is intended for parametrical scanning of the dynamical behavior and optimization</p>	Yes	No

Service of distributed calculations This service extends possibilities of the UM Optimization module. It allows using any computer in a local or global network for parallel numerical experiments.	Yes	No
UM FEM Additional module for including elastic bodies into models. Interface to ANSYS, NASTRAN, ABAQUS and I-DEAS.	Yes	No
UM Control Matlab/Simulink interface. It gives a possibility to introduce Matlab/Simulink schemes (control, electrodynamics, hydraulics) into UM models.	Yes	No
UM Durability Additional module for fatigue analysis	Yes	No

Comparative table of UM Base and UM Lite functional possibilities

Components	UM Base	UM Lite
Rigid bodies	Identically	
Joints	Identically	
Forces		
Joint forces Bipolar forces	Linear Frictional Pointwise Text file External function ... (totally 14 types)	Linear
Linear visco-elastic	Identically	
Contact	Yes	No
Special	Cam Gearing Spring Silent-block	Cam Gearing
External programming	Yes	No
Subsystems	Yes	No