I-DEAS® Mechanism Design™

integrated capability for simulating complex motion of articulated mechanisms

I-DEAS® Mechanism Design™ software is an integrated capability for simulating complex motion of articulated mechanisms. Using assemblies created in I-DEAS Master Assembly™ software, joint constraints, contact locations, and connectivity information are created, and motion inputs are applied. By using the embedded ADAMS dynamic solver, it helps you understand, from the earliest stages of conceptual design, the motions, velocities, and accelerations of a mechanism. And, it allows you to study more design alternatives. The result is a better, more refined product design.

Mechanism Modeling

Mechanism models are defined directly on the I-DEAS Master Assembly geometry. Rigid bodies are automatically created as joints and constraints are defined simply by selecting appropriate topology on assembly or subassembly instances. Mechanism motions are easily defined using a forms-based user interface, and can be sketched or defined using mathematical expressions. For modeling complex functions of motion, the powerful capabilities of ADAMS direct entry functions are used to allow definitions of complex motions. All solid geometry and inertia properties are accessed from I-DEAS Master Assembly.

Mechanism modeling capabilities:

- Joint definitions include: revolute, translations, cylindrical, universal, spherical, planar, fixed, rack and pinion, screw and constant velocity joints.
- Joint primitives can be used together with standard joints.
- Multi-joint capabilities allow modeling of gears.
- Higher order pairs let you model contact constraints in the cam_cam and cam_follower constraints.
- Applied loads include gravity and contact.
- Couplers allow pre-defining the relative motion between two translational, rotational, or cylindrical joints, or any combination of two of these joint types.
- Spring dampers facilitate ease-of-friction modeling.
- Results of a motion simulation include velocities, accelerations, magnitudes, and a sequence of configurations.
- Animation of the sequence allows visual display of the motion envelope of the assembly.
- I-DEAS Mechanism Design can display functional results of motion, velocities, accelerations, etc., and can display up to ten functions simultaneously. This allows you to perform comparative analysis between different functions.
- Notes, tagging data points, and the versatility to modify plot axes and plot headers allow results data to be viewed on screen and sent to a printer for use in reports.
- Functions can be easily listed, plotted, and modified to facilitate iterative analyses.
- Within I-DEAS software, mathematical function manipulations including add, subtract, multiply, divide, scaling, integration, differentiation, and interpolation allow you to quickly modify and manipulate both input and result functions.
- Automatic degrees-of-freedom calculation helps you evaluate the integrity of your design.
- Automatically performs a kinematic or dynamic solve, depending on the remaining degrees of freedom.
- Joint validity checking assures proper joint definition for purposes of the solution.
- Modeling flexibility lets you analyze open and closed loop mechanisms. Automatic solids-based interference and clearance checking, either on a specific step of the solution or over the entire sequence of steps, facilitates evaluation of the design integrity as the assembly articulates.

Relative Motion Analysis

Results Analysis provides post-solution methods for calculating relative position, velocity and acceleration between any two arbitrary rigid bodies, based on results of your solution.

Mechanism Studies

I-DEAS Mechanism Design includes an embedded ADAMS solver. Once joints, constraints, and functions have been defined, the mechanism can be solved automatically using this internal solver, which handles both kinematic and dynamic solves.

Advanced Mechanism Simulation Studies

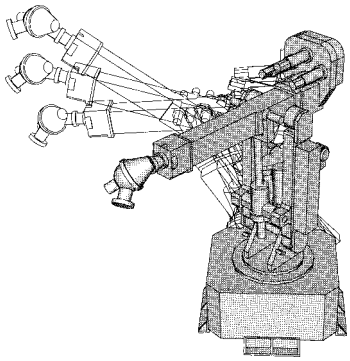
I-DEAS Mechanism Design also provides an automatic interface to external solvers, using the standard ADAMS data model format. You can define the mechanism within I-DEAS, export the data for a more complex motion simulation study using ADAMS, and then read those results back into I-DEAS Mechanism Design for post-processing or iterations on the design. For more advanced analyses, I-DEAS Mechanism Simulation™ can be used.

Prerequisite

I-DEAS Artisan™ Package -or- I-DEAS Product Design Package -or- Master FEM
-or-
Core Master Modeler and Assembly Set

For More Information

For more information, contact your local SDRC representative or call 1-800-848-7372.



Soilds-based kinematics and dynamic analysis simulate complex motions of mechanisms.