NX Motion Simulation-RecurDyn

Integrating knowledge-driven simulation in the design session by predicting complex motion behavior of assemblies and products to meet functional performance objectives

fact sheet

Siemens PLM Software www.siemens.com/plm

Summary

NX® Motion Simulation-RecurDyn software helps designers and engineers predict and understand the functional behavior of parts and assemblies. It delivers a complete and very robust set of capabilities to support all aspects of advanced, dynamic, static and kinematics motion simulation. Joints, springs, dampers, motion drivers, applied forces, contacts and bushings are typical types of design considerations that benefit from the use of motion analysis. The early use of performance simulation is key to the evaluation of design options. It increases design confidence and reduces risk, thus enabling transformation of the design process.

Benefits

Allows investigation of multiple "what-if" scenarios involving simple pre-study to complex assemblies

Eliminates the need to transfer to an external application; the motion model is synchronized with the current design, sharing the same geometric data

Accelerates product development by enabling rapid evaluation and optimization of product alternatives

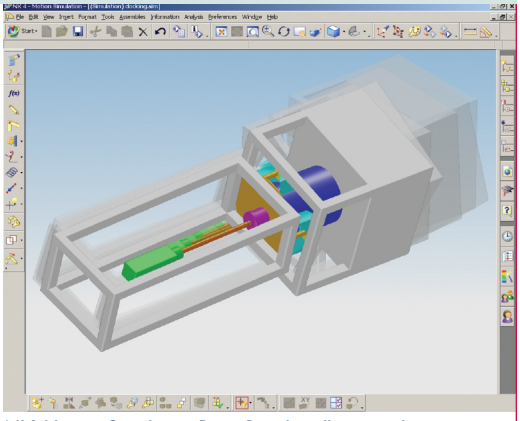
Allows users to gain rapid insight into product performance by animating, graphing and comparing reactions, velocities and accelerations

Directly transfers motion loads for structural and durability simulation

Pushes design parameters back to the design model once they have been optimized

Lowers training costs; designers and engineers can rapidly expand NX skills using the common interface and methodology

Encourages collaboration through easy and rapid communication of results



NX Motion Simulation-RecurDyn handles complex dynamic situations such as docking maneuvers

NX Motion Simulation-RecurDyn provides an advanced yet simple-to-use solution that allows designers and engineers to understand, evaluate and optimize the complex motion behavior of assemblies and products. All geometric models are supported, from simple sketch to complex assemblies, allowing top-down and bottom-up approaches, supporting models from multiple CAD sources via JT™ and other direct translation capabilities. Users can rapidly evaluate multiple (and concurrent) design alternatives at all phases during the design process within a consistent NX interface. NX Motion Simulation-RecurDyn provides a complete solution for kinematics and dynamic motion analysis of rigid multi-body as well as static equilibrium. It is fully integrated with (and leverages the modeling and assembly capabilities of) the NX Design portfolio. When integrated within the Teamcenter software product suite, NX Motion Simulation-RecurDyn helps a user track models and results as well as enables team communication.

Simulation capabilities

- Moving objects or links are defined from the master model (CAD data) or generated from within the NX Motion Simulation-RecurDyn model itself. They remain associative with the geometric objects and the user can override the mass properties as needed. Initial velocity is also allowed.
- There is no limitation in the geometric data organization: points, curves, bodies, components, assemblies (or sets of these data types).
- Motion modeling tools include multiple mechanical joints, constraints, springs, dampers, bushings and contacts in 2D and 3D.
- Movement is activated by one or more of the following: motion drivers, applied forces, torques or gravity.

NX SIEMENS

Features

Kinematics and dynamic simulation of mechanical systems including inertial effects and static equilibrium

Latest multi-body dynamic solver generation – RecurDyn from FunctionBay – for rapid and accurate results

- Includes simple and advanced definition of motion time histories
- Full body contact based on model geometry
- Supported by comprehensive model review and evaluation capabilities

Fully integrated into, and seamlessly leverages, NX modeling and assemblies

Ease-of-use with common NX interface and navigator

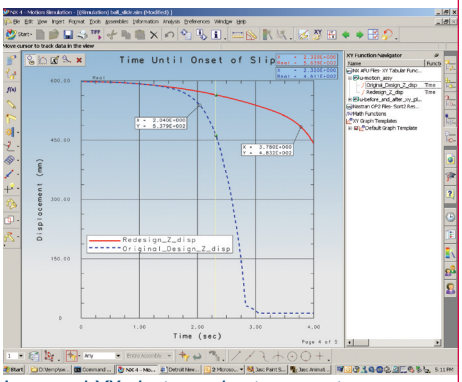
Uses master model concept; data and results are naturally integrated within NX and Teamcenter

Compatible with industry standard solvers, including MSC.Adams, FunctionBay's RecurDyn, LMS Virtual Lab Motion

- Body-to-body capabilities simulate contact and interaction between components within the analysis process.
- Motion drivers and loads are easily defined using an NX integrated function builder; and graphing is open to functional expressions and timetables.
- The functions and resultant graphs are stored in a separate file (.afu), thus allowing re-use of function definition and sharing of data between multiple motion models.
- The answers give the exact real-time behavior of a product. Available results include clearance checking, graphs, movie output, animation and spreadsheet-driven articulation as well as a load transfer facility for structural simulation.

NX integration

- Assembly to motion: assembly defined with mating conditions can be directly mapped to motion links and joints.
- Motion to assembly: the positions and orientations of the CAD assembly, subassemblies and components can be defined directly from within NX Motion Simulation-RecurDyn.
- Positions, mass properties, orientations of all motion data are in synch with any data model modifications.
- Any geometric expression can be modified locally in the motion model for "what-if" studies without changing the CAD master model.



Integrated XY plotting makes it easy to interpret motion analysis results

PLM integration

- Within Teamcenter, the motion model is a specific dataset, by default attached to the CAD master model item revision. The motion data remains in synch with the design revision and assembly BOM.
- All files from the motion solver are attached to the motion model for tracking and later review of results.
- A direct export utility allows sharing a lightweight representation of the geometry and the animation within Teamcenter.
- Users can integrate the solution with Excel to extract data or drive the motion model.

NX openness for automation and customization

- *NX Knowledge Fusion:* automated applications like optimization can be easily achieved. Supported motion objects include links, markers, joints, springs, dampers, bushings, contacts, packaging functionalities, animation, function and graphing results.
- *NX Open (C++):* all Motion Simulation-RecurDyn functionalities are supported.

Product availability

NX Motion Simulation-RecurDyn is an add-on module in the new suite of NX Digital Simulation applications available within the NX digital product development portfolio. It requires a core seat of either NX Design or NX Advanced Simulation as a prerequisite. NX Motion Simulation-RecurDyn is available on most major hardware platforms and operating systems including Unix, Windows and Linux.

Contact
Siemens PLM Software
Americas 800 498 5351
Europe 44 (0) 1276 702000
Asia-Pacific 852 2230 3333
www.siemens.com/plm

SIEMENS