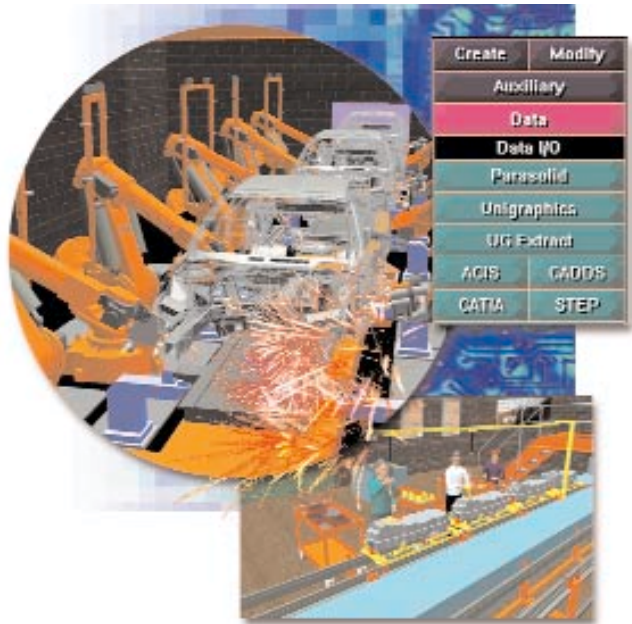# IGRIP®

DELMIA
SOLUTIONS

The Robotic Simulation and Off-Line Programming Solution

IGRIP® is a physics-based, scalable robotic simulation solution for modeling and off-line programming complex, multi-device robotic workcells. Use IGRIP to quickly and graphically construct workcells for applications such as welding, painting, dispensing, material removal and machine tending. IGRIP's comprehensive built-in robot libraries, automatic collision detection functionality and superior device building capabilities delivers unprecedented reductions in man-hours and process engineering lead time while greatly improving program accuracy.

Whether the application consists of modeling a single, specific workcell or an entire factory line, IGRIP offers large- and small-scale solutions guaranteed to improve manufacturing quality, accuracy and profitability.

Generate Off-Line Programs with Confidence

IGRIP's complete line of calibration and off-line programming and post-processing tools allow users to accurately program robotic systems off-line, thus minimizing the impact on production schedules. Calibration tools let users adjust the simulation model to accurately reflect real world device relationships, while the signature interface enables programmers to easily modify robot devices to gain accurate robot motion. Finally, users download the optimized simulation programs using IGRIP's post-processors.

Easily Import CAD Data

Most mechanical CAD databases are supported by IGRIP. Natively use CATIA® or Unigraphics data within IGRIP. Other direct CAD interfaces are available for IDEAS®, Pro/ENGINEER® and CADDS5. Neutral translators include IGES, DXF, DWG, VDA, DES, STL, and STEP.

Eliminate Damage and Reduce Risk

IGRIP's standard collision detection functionality allows the user to create multiple collision and near-miss queues to ensure collision-free operation. IGRIP also includes an automatic path planner for creating collision-free robotic motion trajectories.

Analyze Real-Time Performance

Simulation cycle times can be displayed and charted. Cycle times can be automatically optimized, or an available interactive interface can be used for custom tuning. 3D graphical traces of the robot trajectory can be plotted with optional interval cycle times. Use the RRS (Realistic Robot Simulation) option to obtain extremely accurate cycle time predictions using the native robot controller algorithms.

Flexible Device Building

IGRIP's device building capabilities offer unprecedented power and ease of use. Create complex kinematic devices and/or modify existing devices to accurately reflect the real world. IGRIP includes all the attributes necessary to model even the most complex devices. Standard kinematic and motion planner algorithms are only a button click away, while complex kinematic or motion planner routines are easily created and integrated. Also, assign user-defined attributes to devices to enhance simulation realism. Use the Dynamics option to assign dynamic properties and provide comprehensive dynamics analysis capabilities.

Rapidly Develop Workcells

IGRIP includes the most comprehensive library of robot models available, with more than 500 industrial robot models, including the latest from FANUC, ABB, Motoman and Nachi. Application-specific devices such as weld guns, work piece positioners, rails/gantries, and workpiece clamps are available in options such as Arc, Spot, and Paint.

Graphical Programming

Create complex simulation programs using IGRIP's simple graphical programming interface. Use one interface to program an entire simulation, including multiple robots, fixtures and material handling devices. IGRIP's teach pendant interface offers an alternative programming interface for those more comfortable using robot teach pendants.

Visualize and Communicate Design Concepts

Enhance realism by assigning high quality texture images to geometry, or use IGRIP's robust lighting and material property functionality. Optimize workcells by using on-line and batch mode data reduction tools. Manipulate and visualize data-intensive workcells with ease using the built-in level of detail (LOD) management tools. Standard digital output functions for AVI, MPEG, JPEG, TIFF and VRML formats make it possible to quickly and easily visualize your data in other applications.
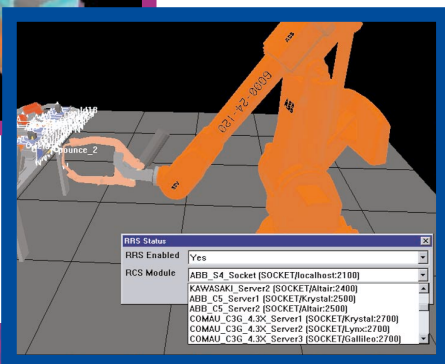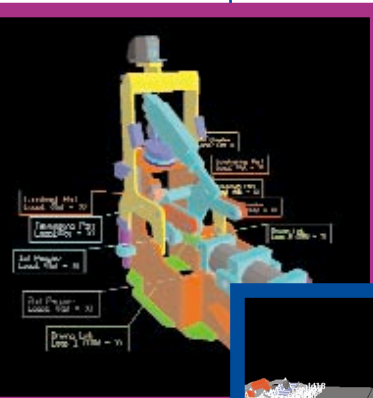
Human Motion and Workplace Assessment

Use the DELMIA/ERGO option to design safe working environments that accommodate a wide range of workers. Engineers use DELMIA/ERGO to address human interface issues that impact the ability of a wide range of humans to assemble and maintain a proposed product design.

Virtual Reality

The Virtual Reality option enables programmers to immerse themselves into the simulation both visually and tactilely. IGRIP supports a variety of virtual reality equipment such as the cyberglove from Virtual Technologies, Inc, and Ascension Technology Corporation's Flock of Birds. IGRIP also provides a stereo display interface for realistic 3D stereo.

Spot Welding

The Spot option provides specialized tools to support both traditional and fixed TCP spot welding applications. Included in the Spot option is a fully functional tooling interface for the construction and simulation of complex tooling and fixture device clamps. Collision-free robot trajectories can be automatically determined, and numerous optimization features can be used to reduce process cycle times.
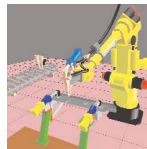
Painting

Included in the Painting option is a complete set of painting simulation tools. Spray gun and paint attributes can be entered into the painting device and the results can be graphically displayed in multiple colors illustrating relative film thickness; or exact thickness can be obtained though the uses of a built-in film build gauge. Complex paint booths can be constructed, and multiple robot moving line applications can be simulated.

Assembly Planning and Process Documentation

Visualize and validate design for assembly and disassembly. Facilitate development of multilevel assemblies, sequences, part paths and process documentation. Used in conjunction with DELMIA/ReView, simulation recordings can be distributed throughout the entire enterprise for shop floor instruction and process visualization.
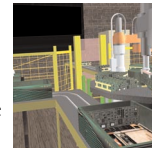
Arc Welding

Included in the Arc option is a fully functioning tooling interface that allows for the construction and simulation of complex tooling and fixture Devices. Clamps and workpiece positioning devices can be coordinated with Arc Welding robots. Collision-free robot trajectories can be automatically determined and numerous optimization features can be used to reduce process cycle times. Seam searching sequences can be automatically generated and weld "details" can be stored in a database for reuse. The unique Arc Welding macro system allows the user to define and reuse arc welding process knowledge to greatly reduce programming time.
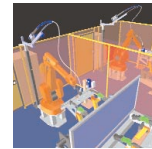
Finishing

Use the finishing option to model any robot application including waterjet and laser cutting, material handling and deburring/polishing applications. Complex, multi-device workcells can be quickly and graphically constructed. Application process data can be included in the simulation and accurate robot programs can be output.

Other options: Please contact your account manager for more information.

Cabling: The ability to create and simulate cables.

Calibration: A robust, highly accurate module for characterizing and applying an articulated mechanical device's signature to an individual device model.

Dynamics: Full support for dynamics analysis and simulation of multi-link, tree-structured mechanisms with any number of closed-loop kinematic chains.

Parasolids: A solid modeler, based on the Parasolid kernel, used to create part geometry.

RRS: Simulation allows DELMIA's simulation software to interface with a robot manufacturer's proprietary motion planning software (called an RCS module) to provide greater accuracy in the trajectory motion and cycle time prediction.

VCE: Enables users to connect with other users, synchronize DELMIA processes, and visualize a simulation of the same workcell running on more than one workstation.

CADverters: Various import and export capabilities to the leading CAD software.

IGRIP®

## Open Architecture for Easy Integration

IGRIP's open architecture allows users to program custom functions with unparalleled ease by creating menu functions, custom device kinematics and motion planning algorithms.

Built-in Geometric Modeling Environments

Built-in 3D CAD and 2D draw environments are available with IGRIP and can be used alone or in conjunction with imported geometry from IGES and DXF.

Seamless Integration

IGRIP is part of an integrated suite for Digital Manufacturing, with a range of solutions for discrete event simulation and analysis, human motion programming/fast analysis, and assembly simulation. From inspiration to execution, DELMIA solutions help you manufacture high quality products quickly and efficiently at a lower cost, the first time, every time.
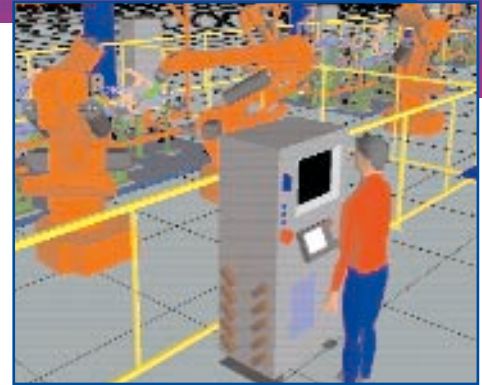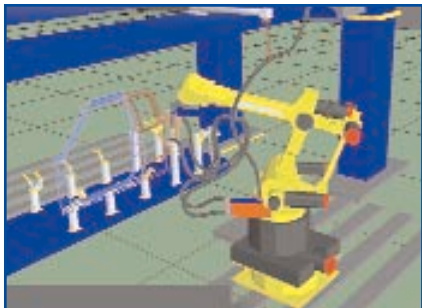
- Easy-to-use graphical programming interface
- Robust application-specific solutions
- Extensive libraries of models and post-processors
- Push-button links to robot manufacturer's motion algorithms
- Seamless CAD integration

Ultra Products for Application-Specific Tasks

For those that require a less robust, more specific, focused application, such as arc welding, spot welding or painting, DELMIA offers another cost-effective, focused solution tailored exclusively for the following applications:

- UltraArc for arc welding
- UltraSpot for robotic spot welding
- UltraPaint for robotic painting applications
- UltraGRIP for robotic finishing and other applications including waterjet and laser cutting

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ROBOTICS

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