

RapidSIMM™

connecting external real-time motion simulations to DIVISION MockUp

RapidSIMM enables a versatile solution connecting real-time, accurate numerical simulations to large and realistic digital mock-ups.

RapidSIMM controls motions and other real-time events within DIVISION® MockUp models that are driven by an external simulator. This provides a solution in which large and complex CAD models may be visualised in conjunction with accurate motion simulation.

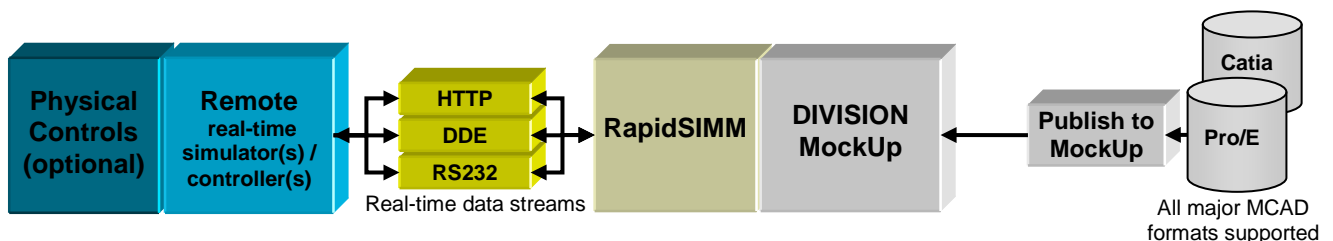
Purposes	Benefits
Analyse the 3D spatial design with accurate motion control	Reduce number of prototypes
Enhance Human Factor analyses - operations & maintenance	Increase Innovation
Design Reviews	Resolve Issues quickly
Present complex assembly motion issues effectively	Improve Design Communications
Interactive Instructions – movies and interactive content	

Overview

MockUp offers many benefits for the real-time display and operation of large models, since it has extremely fast graphics and spatial analysis tools, it is CAD heterogeneous, multi-user, and supports a variety of interactive devices which are all data independent.

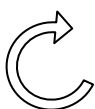
RapidSIMM supplements MockUp with:

- run-time simulation functions that control the movement of MockUp assemblies in defined ways
- a communications structure and protocols to communicate with an external simulator

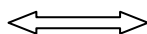


A MockUp model is prepared and “calibrated” using RapidSIMM and MockUp to check motion behaviours with the range of data expected from the external simulation tool. This is done by applying and calibrating RapidSIMM Action Functions that mimic the effects of mechanisms being simulated. Once the model has been calibrated, communications are opened with the numerical simulator and real-time values then drive the Action Functions that have been defined.

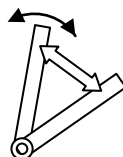
Rotation Joints



Slide Joints



Elbow Joints



Look Up Table (LUT) joints



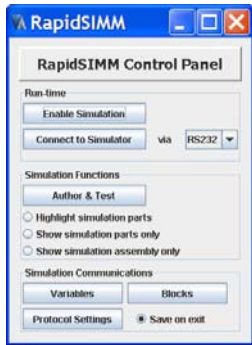
Two other functions are provided for advanced control over other Action Functions that the user may optionally define using MockUp’s Motion Planning Option to control additional affects within MockUp:

Boolean: A true/false state message

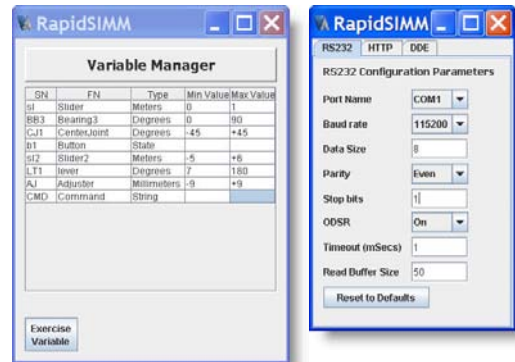
Message: A string that can be interpreted as the user wishes

Communications set up:

RapidSIMM communicates with the external simulator through a defined data-stream of variables and values. These may be in random order pairs or may be put into an ordered stream in which only the data values are sent, in a named block, in a specified order.



At the core to the communications are the variables that match values from the external simulator to specific Action Functions. Each has a type so that values can be set up and applied correctly to Action Functions while reducing mistakes, and each has an optional min and max floating point range value. Range values are used in an action function to catch out of range values at run-time and are used during calibration to form a min/max range of allowable input values. A variable may be applied to more than one Action Function so a function to exercise (test) a variable for all Action Functions is provided with the Variable Manager.

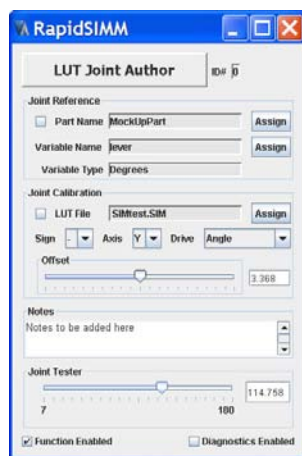
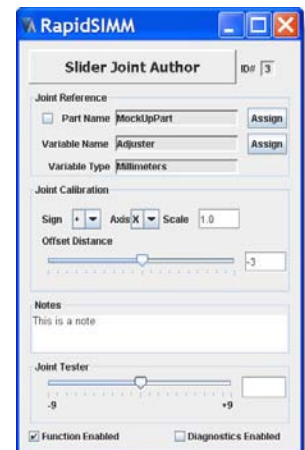


Action Function Authoring



Action Functions are dynamically created, modified, or deleted from within the RapidSIMM application. The Kinematics Manager panel controls the list, their type, and whether they are active (Enabled) within MockUp. Each Action Function's detailed parameter set is then managed through a specific GUI and attached (and re-attached if necessary) to a specific part in MockUp when it is selected and the Assign button is pressed.

Notes may be added to each Action Function detailing how the function parameters match up to the external simulator function and a variable input tester is also provided to exercise the variable specific for the Action Function being edited.



The LUT Joint references an external file that defines the look up table itself. The look up values may represent angles or distances.

As Action Functions are managed outside the MockUp data environment, they are tolerant of CAD data republishing. Those that refer to out of date assemblies may be re-assigned easily.

Solution Requirements

- DIVISION MockUp or DIVISION Reality (2000i2-1 DSU 6 (2004268) or later)
- Java j2se v1.4 (or later) run-time

About Visual Advantage

Visual Advantage has had extensive experience with DIVISION and PTC products over the past 15 years. We offer an extensive range of products and services to extend the functionality and performance of the MockUp product for clients who aim to realise its full potential. Visual Advantage is a PTC PartnerAdvantage™ member.

Please contact us for further information >>

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