RESEARCH SIMULATION SIMPLIFIED
COMPLETE SOLUTIONS FOR DRIVING RESEARCH
Realtime Technologies’ driving simulators are turn-key driving simulation platforms that can be applied to research, training, or automotive product development programs. Our modular, scalable system designs allow you to add components to your existing simulator, avoiding the need to replace your entire simulator as your fidelity needs increase.

- Complete software and hardware solutions
- Real-time dynamics
- Visual systems
- Scenario authoring
- Scalable products
The RDS-100 Desktop Driving Simulator brings the performance of mid- to high-fidelity simulators into a compact lower-fidelity package. Using Realtime Technologies’ core software, built from SimCreator, complex simulations are run on a high-performance PC platform. Now, the features traditionally reserved for expensive, high-end simulators are within reach to those with a more modest budget.

**Includes:**

- Operator station laptop
- High-end simulation computer
- Three 27 inch HD monitors
- USB-based steering wheel and pedal set
- 2.0 audio system
Includes:

- Operator station laptop
- High-end simulation computer
- One 55 inch HD monitor
- USB based steering wheel and pedal set
- 5.1 surround sound audio system

The RDS-500 is next level in fidelity and the best value in research driving simulation. The RDS-500 utilizes the same robust software found on high-fidelity research simulators. Realtime Technologies has created a low-cost, network capable, lightweight research simulator with perpetually licensed software.
The RDS-1000 has the smallest footprint for real-vehicle equipment, including a real steering wheel with control loaded steering, real accelerator and brake pedals, along with a fully customizable virtual dashboard. The RDS-1000 features a quarter cab design with a standard 150-degree field-of-view, which can be expanded to 210 degrees. The RDS-1000 is available with an optional 3 degrees of motion platform.

Includes:

- Steering subsystem
- Real brake and accelerator pedals
- Cab input/output signals
- Three large-panel monitors
- Host of three visual channels
- 5.1 surround sound audio system
Includes:

- Full or half cab options
- High-fidelity steering subsystem
- Real brake and accelerator pedals
- Cab input/output signals from turn signals, wipers, steering wheel buttons
- Fully customizable virtual dashboard
- Three or more HD high-lumens projectors
- Host and visual channels to match visual system
- 5.1 surround sound audio system
- Vibration transducer for road rumble feel
- Center stack touch screen available
- Motion options available (3 DOF or 6DOF)

For the ultimate research driving simulation experience, step into the RDS-2000 full-size cab simulator. This full-scale cab has all the features you would find in a real vehicle. All the driving components can be linked directly to the Realtime Technologies’ software providing realistic driver feedback and accurate data collection. The fully instrumented vehicle cabin allows for a more life-like experience that will, in-turn, give you the data needed for your research.
The RDS-Modular provides a real-life driving experience similar to the full-cab setup, but it also provides more flexibility when making modifications to the hardware. The hardware can be rolled in and out of the space.

Includes:

- High-fidelity steering subsystem
- Real brake and accelerator pedals
- Cab input/output signals from turn signals to steering wheel buttons
- Three or more HD high-lumens projectors
- Host and visual channels to match visual system
- 5.1 surround sound audio system
- Optional A-pillar design
The research bike simulator is available as an add-on to the RDS products. A mirror will be inset onto the projector screen so the rider can see behind them. Sensors are placed at the front and rear wheels to measure wheel turning angle and speed of the rider. A constant force-resistance attachment will also be placed for rear-wheel pedal force. The short-throw front projector will be combined with one computer for SimCreator and visuals.

**Includes:**

- Full-size adult hybrid bicycle
- Platform with turn table for steering
- Forward projection screen and projector
The Software Suite is made of up of several product offerings. Regardless of which simulator you purchase, the same world-class, leading research software is included.

SimCreator is the cornerstone software package, used to run the simulator and manage communication between the different subsystems such as audio, visuals, motion, dynamics, steering, scenarios, etc.

ExACCT allows you to create your own geo-typical databases and add cultural features, as well as scenario scripting.

- One-time license cost
- Same software runs all simulators
- Custom modifications available
Real-Time Simulation and Modeling System

SimCreator provides the core software for the vehicle simulator and is a high-fidelity, real-time driving simulation software. It is a Windows-based graphical modeling environment with a standard library of components for basic mathematical operations and signals.

The software manages the communications between all of the relevant subsystems, including visuals, scenario control, audio, motion, control loading, and data collection. SimCreator supports exporting models to C/C++ code and libraries for use in external code. It enables building and running models with a host and remote computer. SimCreator can run on both Windows and Linux environments.

SimCreator comes bundled with Altia Design, which allows easy creation and integration of user interface components for virtual dashes or secondary tasks.
SimDriver

Autonomous Vehicle Control Solution

SimDriver is a transfer-of-vehicle-control solution used for the evaluation of human interaction with automated vehicles in both city and freeway driving environments. SimDriver enhances the understanding of this relationship, which will be key to ensuring safe autonomous vehicles.

SimDriver can offer data that shows why drivers become distracted and how to smoothly re-engage into the task of driving. SimDriver’s ability to run code through a simulator is a considerably more cost effective and safer alternative than an expensive prototype.
**SimVehicle**

**High-fidelity, Multibody, Real-Time Vehicle Dynamics Model**

SimVehicle is delivered with all Realtime Technologies’ simulators. It contains a pre-built 4-wheeled, high-fidelity, real-time vehicle dynamic model. The included Vehicle Dynamics Editor GUI makes it easy to edit vehicle data files or to create new vehicle models. SimVehicle can be used for operator-in-the-loop or hardware-in-the-loop simulators.

SimVehicle models all four corners of the vehicle coupled with a 6-DOF Body component. A powertrain model calculates the torque at the wheels, based on the brake pedal, gear, and accelerator pedal inputs. Each vehicle corner incorporates spring and damping rates, bump stops, anti-sway bars, anti-squat, anti-dive geometry, and roll axis height. The unsprung mass is modeled as a separate body connected by a prismatic joint to the base body.
SimVista

Scenario Control and Seamless Driving Environments

SimVista is a tile-based database and scenario authoring tool with various geo-typical tiles that can be placed (drag and drop) to create rural, suburban, freeway, and city driving scenarios. Tile-based terrain tiles are from a library developed by Realtime Technologies that allows you to build your road network from standard tile blocks. After the road network is built, you can then add additional models onto the world to create cultural features such as trees and vehicles. Once your road network and cultural features are placed, you can then add scenario behavior elements using ExACCT. SimVista is also delivered with a pre-built database called Generic World that includes freeway, rural, and suburban environments.
Video Capture and After Action Review System

SimObserver is a stand-alone video capture and after action review system. SimObserver’s MPEG-2 video compression and open communications protocol allow you to record digital video and real-time data from multiple independent sources. Up to four independent video sources are stored in a quad view video format.

Key features of SimObserver: direct MPEG-2 video capture, real-time video titling, up to four camera views, event mark and review, remote command interface, synchronized video and data stream capture.
Programmable Maneuvers

Maneuver Designer provides researchers with the power to program their own maneuvers in addition to the ones provided with the ExACCT products. Maneuver Designer provides context help when programming, much like the features in a Microsoft Visual Studio environment. It also does some light error checking. There is a WYSIWYG interface for creating documentation so other users can understand the intent of the maneuver.
ExACCT

Next Generation SimVista Authoring

ExACCT is the latest generation of Realtime Technologies’ scenario authoring and development software founded upon SimVista. This new graphical user interface allows researchers to rapidly develop scenarios with pre-defined configurable behaviors called maneuvers.

ExACCT provides various user permissions to facilitate both development and experimentation mode. Using ExACCT’s scenario control panel, the researcher can select their experiment and run the scenarios.
Advanced Scenario Creation

ExACCT Professional uses the ExACCT base software with an expanded scenario programming ability that accommodates over 350 commands. Additionally, Professional features a conversion of existing SimVista databases and scenarios into ExACCT.
Training can occur either at Realtime Technologies’ site in Ann Arbor, Michigan or at the customer site within the lower 48 states. Realtime Technologies will provide up to 5 training laptops during the training session. For optimal training, the number of trainees should be limited to 3-5 people.

If additional training is desired, it can be purchased at a later date. For example, if there is lab turnover with researchers, training may be required for the new research staff.

### 3 day training covers the following topics:

- Basic simulator operation and “Quick-Start Guide”
- SimVista world building
  - Basics
  - Best design practices
- SimCreator mechanics
  - Making your own model
  - Understanding components
  - Understanding your data
- Altia design basics with SimCreator
- Scenario building with ExACCT and Maneuver generation
  - JavaScript basics
  - Scenario control (sensor types)
  - Using pre-built databases
**WARRANTY/SUPPORT**

**SIMULATORS**

The simulators provided by Realtime Technologies will come with a one-year limited hardware warranty. This warranty is limited to normal use and does not include expendables such as projector bulbs or damage caused by the customer personnel or contractors not associated with Realtime. This warranty is provided by the factory and involves free repair or replacement of parts when they are shipped to the factory at the customer’s expense.

**SOFTWARE**

Realtime Technologies provides software support services for all software provided and maintained by Realtime Technologies. Products include, but are not limited to, SimCreator, SimVehicle, SimSimulator, SimVista, SimObserver, ExACCT, Maneuver Designer, Data Distillery, SimDriver, SimConnect, and Core Driving Simulator.

Software support services are available for purchase after the first year. Included in the software support services contract is unlimited email and phone support for software-related issues.

Realtime maintains a customer support hot-line that is available from 8 am to 5 pm Monday through Friday.
WHY REALTIME TECHNOLOGIES

Numbers – With over 180 personnel, confidence comes from knowing that the answer resides in-house.

Innovation – We allocate a percentage of our earnings to internal research and development.

History – Blending a hard-working mentality with the advancements in technology.

Integration – Bridge the state-of-the-art, with the art of the possible.

Knowledge – With multiple markets, we create a depth and breadth of knowledge that’s unsurpassed.

Support – Unmatched customer support to troubleshoot, diagnose, and answer your questions.

Partnership – The type of relationship we forge with our customers.
REALTIME TECHNOLOGIES SPECIALIZES IN MULTIBODY VEHICLE DYNAMICS, AND GRAPHICAL SIMULATION AND MODELING. WE OFFER SIMULATION SOFTWARE APPLICATIONS, CONSULTING SERVICES, CUSTOM ENGINEERING SOLUTIONS, AND SOFTWARE/HARDWARE DEVELOPMENT.