QuadDS Driving Simulator
MECHANICAL SIMULATION

World’s most validated vehicle dynamics software serves as the foundation for Mechanical Simulation’s Reconfigurable Driving Simulator

Mechanical Simulation Corporation designed this turnkey Engineering Driving Simulator for customers requiring accurate vehicle dynamics and interfaces to existing engineering tools, vehicle data, and test plans. The combination of validated vehicle dynamics, four axes motion, a precision steering system, and an immersive audio-video system delivers the most realistic and cost effective driving simulator on the market.

The QuadDS is a reconfigurable tool designed to be used by multiple engineering and technical marketing disciplines to expedite product design and demonstrate complex technologies to a wide audience of drivers.

The simulator is powered by the same CarSim and TruckSim software used by the world’s largest automotive manufacturers and Tier 1 suppliers. Companies already using Mechanical Simulation software can drive the same vehicle data and controller models (SIL or HIL) that have been developed and validated by their engineering departments.

QuadDS Features:

- A vehicle math model extensively used and validated by vehicle manufacturers.
- A system the executes the vehicle math model, motion control algorithm, and control models on a single, high-performance computer to minimize data delays and jitter.
- Open architecture hardware interface allowing customers to integrate custom hardware such as ECUs, driver monitoring devices, and HMI controls.
- A motion system designed for maximum safety and low maintainence, while providing drivers with a sense of vehicle speed and immersion typically found in larger, more complex simulators.
- A selection of two visualization systems: Mechanical Simulation Visualizer or Unity3D generated scene using Mechanical Simulation bi-directional network plugin.
- Interfaces to 3rd party traffic and collaborative driving/ITS tools.

carsim.com
Applications for Engineering Driving Simulators

- Design and tune electronic stability controllers, active braking systems, and other adaptive controllers.
- Develop and demonstrate ADAS and driver convenience systems such as active cruise control, lane keeping, active parking assist, and collision avoidance.
- Evaluate hybrid and electric powertrains.
- Evaluate powertrain and transmission calibrations.
- Evaluate active suspension design options.
- Capture data describing driver behavior (impaired/distracted drivers, HMI interaction, vehicle response to cross winds).
- Showcase technologies at trade shows or technology events.
- Model based evaluation of tires and steering systems.
- Distracted driving education.
- Driver training and course familiarization.
- Evaluate multi-vehicle and V2V technologies using interconnected/networked driving simulators.

Specifications

Motion Platform
- Three Degrees of Freedom + vibration
- Four Linear Actuators (35 mm stroke)
- Power Requirements: 20A 120VAC circuit
- Reconfigurable Instrument Cluster

Driver Controls
- Steering - Precision torque OEM Electric Power Steering Unit
- Pedals - OEM pedals
- Shifter - OEM Automatic Shift Lever
- Car or Truck/Bus seating configurations
- Eight user-defined push buttons

Interfaces
- MATLAB/Simulink
- AI Traffic and Networked Simulator Traffic
- Hardware connectivity via CAN channel (optional)
- User configurable motion control architecture
- Analog outputs

Computing System
- Windows 8.1
- CarSim or TruckSim Simulation Software
- Two high performance Intel PCs

Audio-Video Systems
- Three 70" LED displays (other sizes are optional)
- Two hundred degree field of view
- 5.1 Surround sound

Visualization System
- Mechanical Simulation Visualizer
  - Rapid scene development
  - Heads up display system
  - Sophisticated 3D road model
- Unity3D or other commercial game engine
  - Bi-directional communication
  - High speed network interface
  - Access to community supported assets
  - Wide variety of weather and lighting effects