

Research and Development Examples

Experiment on Lane Holding Function

The experiment on the interfaces with the driver including car control algorithm and steering reaction forces can be made by using the lane information on the simulator.

Experiment on Collision Avoidance System

The experiment on car control algorithm can be made by using the information on other cars in the vicinity of own car.

Experiment on ACC (Adaptive Cruise Control)

The experiment on brake control algorithm can be made by using the information on other cars in the vicinity of own car.

Experiment on ALS (Adaptive Lighting Control)

The experiment on brake lamps can be made by changing the lighting patterns and positions.

Experiment on Inter-vehicle and Road-to-Vehicle Communications

The experiments on communication timing and information processing algorithm can be made by using the information on other cars in the vicinity of own car and road information.

Experiment on Warning System

The experiments on the warning system to transmit to the driver the information that is obtained from the inter-vehicle communications and road-to-vehicle communications can be made.

Experiment on MATLAB/Simulink Model

The experiments on various models including MATLAB/Simulink that the customer possesses can be made by connecting such models to the simulator.

Experiment o ECU

The experiments for the ECU (electronic control unit) development can be made by building the HILS (hardware in the loop simulation) environment and connecting the simulator to it.

Evaluation of Car Characteristics

The experiments on car characteristics can be made by using the commercially available car motion calculation software such as CarSim® and TruckSim®.

Evaluation of Driver’ s Characteristics

The experiments on the driver’ s characteristics in various situations including relations of the driver with operation support functions, fatigue and sleepiness can be made.

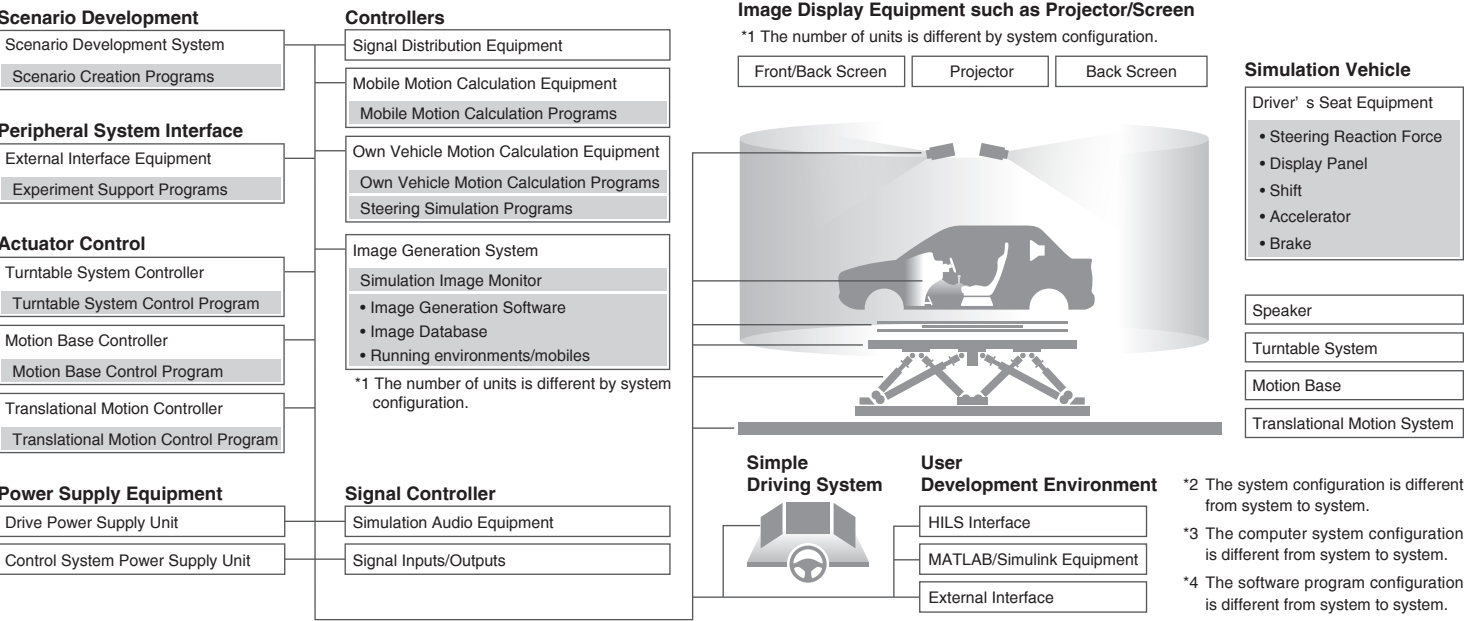
Supply Records

A number of the JRC simulators that have been customized to the customers’ demands and adopted as aircraft training simulators, car driving simulators and vehicle testing equipment by the customers.

Car Driving Simulator	: 3 sets
Other types of simulator	: 42 sets
Special motion base system	: 5 sets



Typical System Configuration





Excellent in “Time” , “Cost” , “Information Disclosure” and “Functionality” , the JRC Driving Simulator can provide the adequate environment for your car design and research and development.

The Car Driving Simulator incorporates an image display unit which presents various car driving scenes such as expressways, city areas and mountainous areas. By using this simulator, you can make experiments which might be dangerous with an actual car and repeated tests in the same environment. JRC can provide various simulated environments to meet your needs to support your various research and experiments, allowing the cost reduction, time saving and higher accuracy in your car developments and experiments.

System Flexibility

The simulator is designed to meet each customer’ s purpose and needs which are different in system configuration and detailed functionality. The driving simulator with high originality will be provided to you.

Functionality for R&D Concepts

JRC recommends new simulation functions to meet new R&D concepts and experiment approaches, supporting your R&D environment considered for user-friendliness foremost.

Disclosure of I/O Interface

The JRC driving simulator discloses its interface information as much as possible. In particular, the necessary data including inputs/outputs of the results of motion calculations in the simulator are disclosed to the utmost, allowing the users to create applications after the delivery of the simulator.

System Configuration for Purpose of Use

The driving simulator is designed for the purpose of research and development and it is effective to introduce the simulator as an appropriate scale of equipment in a proper timing. The system can be configured flexibly for later upgrading for the future expansions ranging from minor design changes to major modifications.

Preparatory Time Saving for Experiments

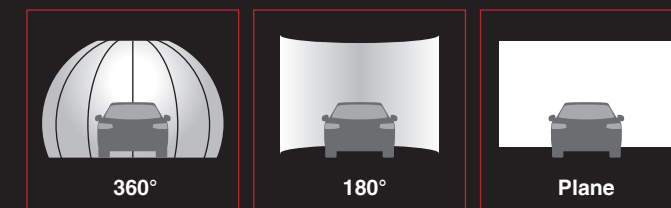
By the use of visual user interface and the customized system design for each user, the simulator is designed with consideration to shorten the preparatory time for experiments such as scenario creation time (on the simulator side)

Reduction of Running Cost

The disclosure of interface information can reduce the running cost of the simulator. For instance, if the specifications of the image database are disclosed, the user can design the image database independently.

System Components

Screen Dome System



Projector System

JRC can flexibly support various needs ranging from adoption of any projector system to selection of any projector manufacturer as specified by the user.

Cockpit System



Reaction Force System

JRC can support any steering reaction force and any pedal reaction force.



Seat Vibration System

The seat is equipped with a vibration speaker to realize various running sensations.

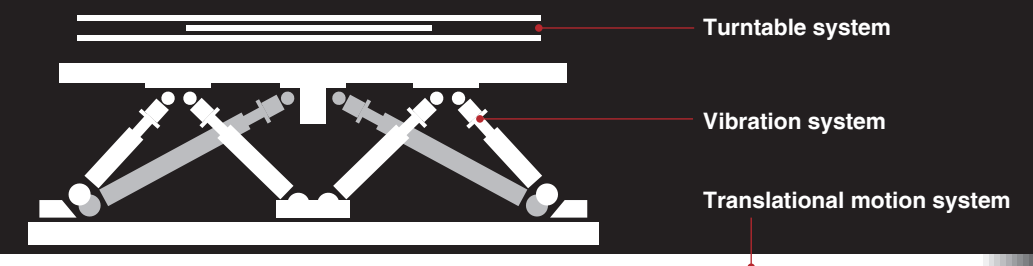
Audio System

Various audio systems ranging from a simple type to a reality-pursued type are available.

Speaker

Motion System

The motion system can be customized by using the JRC’ s original motion cueing software and by incorporating the control logics prepared by the customer.



Car Motion Model Operation Software

The simulator incorporates the commercially available car motion model operation software for driving simulation. By connecting the digital analysis software, the user can make model developments.

Log Data Acquisition Software

The software to acquire the log data during simulation is available for the use in data analysis after simulation.

Image Software Various images can be presented with high resolution at a high refresh rate and in real time on the display screen.

Road Studio

Road Studio is the software to create visual database for the simulator, which can select any necessary topographic features from the topographic database to create a road in the basic topographic scene.



Meter Studio

The Meter Studio is the software to design and drive the instrument panel which has never been before. It allows a new design checking work to be completed before making the hardware.



Safety Device System

The safety device plays an important role for the simulator using actuators. It can provide system safety by fail-safe functions.

Computer System

Various operation systems including Windows OS and RTOS are available to meet the user’ s demand.

Signal Distribution System

Various communications protocols such as CAN and FlexRay are available to meet the cockpit as specified by the user.

Others

Other systems such as camera system and voice communication system are also available.

Driving Simulator for Prior Confirmation



The simulator allows the running confirmation with the gamepad before operating the simulation. The same system configuration as the cockpit system which is equipped with the reaction force system is also available.