

FORUM8 Motion-based Real Car Driving Simulator



This simulator is based on the use of a real right-hand drive car, e.g. the Microcar of Ligier. However any vehicle could be integrated within a similar driving simulation system.

All original equipment is retained and interfaced to the VR-Design Studio software through an electronic gateway linked to the vehicles central CAN bus.



Features:

- The original steering wheel is linked to a Fanatec Club Sport wheel base with brushless servo motor to produce the most realistic driving effect
- The original gear lever is replaced by a dual transmission (manual gear and automatic) Fanatec Club Sport shifter
- The manual brake is mechanically linked to a Fanatec Club Sport Handbrake
- The original seat belt switch is connected to the central gateway
- The original driver seat is mechanically adjustable horizontally and vertically
- Original comodo provides indicators, headlights, wipers and horn commands all redirected to the central gateway
- The ignition key will start the virtual car in the simulation software
- Fuel, pedal, clutch and brakes are linked to a Fanatec Club Sport pedal set with Damper kit to enhance the hydraulic brake effect. Clutch pedal is removable to switch the Simulator to automatic transmission
- Original control panel and real counters dashboard are linked to the central gateway to reproduce the virtual car behavior: speed, RPM, lights, indicators...
- Inside mirror and lateral mirrors are replaced by 4" screens displaying rear and lateral views of the simulation
- Avermedia 5.1 Sonic-blast sound bar will be installed on the back of the car. Original speakers will be used also to display the simulation sound as well as the trainer / researcher instructions
- A wireless camera with incorporated microphone will be installed to be linked to the central instructor station to monitor driver behavior and to allow communication between the driver and trainer / researcher
- An inboard Wi-Fi tablet, will allow MCQ forms to be sent from the instructor station and filled-in by the driver
- An inboard alarm switch will be installed to over-ride the motion system in the event of danger
- A general pushbutton will start/stop the associated simulation PC
- A central switch will power up the car, the video system, the simulation PC and the dedicated air conditioner unit
- The electronic central gateway will deliver all required information to the central PC through a USB link. This same USB link will deliver the required data to the panels and indicators

Simulation PC

The simulation PC Hardware will be typically based on:

- PC Be Quiet! Silent Base 601 Window Black- BGW26
- Motherboard MSI Z390 GAMING PRO CARBON - LGA1151(2017)/DDR4/ATX
- Processor Intel Core i9-9900K - 3,6GHz/16M/LGA1151(2017)
- Water-cooling Cooler Master Liquid ML120R RGB MLX-D12M-A20PC-R1
- Memory PC Ballistix BLT16G4D30BET4 RGB (16Go DDR4 3000 PC24000)
- Master Disk SSD Samsung 500Go SSD M.2 - 860 EVO
- Internal Data Disk 3.5" Seagate 4To SATA III Iron Wolf ST4000VN008
- 2 Graphic cards MSI RTX 2080Ti - 2080Ti/11Go/DP/HDMI/USB-C
- Power Supply Be Quiet! ATX 700W Pure Power 11 - 80+ Gold
- Microsoft Windows 10 Pro 64Bits COEM + English + Arabic pack

Visualization System

The proposed visualization system is based on three 75" Toshiba 75U6863DG 4K Screens (or equivalent).

The front stand and the right stand are fixed to the car (or to the platform if motion system is used). The left stand is articulate around the front stand, to allow drivers to enter the car.

A schematic of the screen positioning is shown below:



An alternative visualization system could be based on multiple projectors with a screen from 45° to 360°

Motion Option

A 3 DOF motion system will be installed its platform to support the car. The base of the platform is linked to the visualization system and is anchored to the ground for safety.



Standard characteristics of the motion platform are:

- Payload: 550kg Heave: 276 mm, 276mm/s, 0.4G
- Pitch: -11.1° +10°, 22°/s, 250°/s² Roll: ±9°, 18°/s, 250°/s² & Weight: 436kg



FORUM8 is an award-winning Japanese engineering software company and world leader in Interactive 3D VR Simulation & Modelling software technology. Established in 1987, FORUM8 has offices and partners on every continent and is a member of the ITE and an associate of the TRB Visualization Group. FORUM8's flagship product, VR-Design Studio, allows users to create and utilize highly immersive and fully customizable interactive 3D environments, as well as visualizing data from a wide range of leading third-party products, in a highly cost-effective and time-efficient manner.

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