



aVDS

advanced Vehicle Driving Simulator

aVDS is part of a family of solutions covering workstations to static simulators to dynamic simulators with motion.



Workstation



Static



aVDS

Overview

The advanced Vehicle Driving Simulator (aVDS) is a versatile and innovative driving simulator, combining a high-performance motion platform and high specification audio and visual hardware with industry-leading virtual content from rFpro. The result is a simulator capable of accurately representing the smallest changes to a vehicle's configuration – an ideal instrument for the future of vehicle development.

Advantages

The aVDS has been designed to reduce new vehicle development timescales and costs by allowing meaningful testing far earlier in the vehicle development process. It utilises high specification linear actuators to deliver class-leading 6DoF dynamic performance, with up to 50Hz frequency response, providing a tightly harmonised driving experience. The motion platform can be quickly configured to take a variety of payloads up to 500kg, facilitating the installation of real vehicle cabins. The simulator's impressive motion envelope is further enhanced through the use of advanced cueing, which has the effect of extending its excursion.



The unique 'wedge action' design delivers an unparalleled combination of high stiffness, low weight and inertia, and linearity of motion ratio. This delivers extremely low latency and a high frequency response. Incredibly small parameter changes that are statistically significant to the driver can be made due to the consistent response throughout the travel range. The high level of decoupling between degrees of freedom gives an excellent excursion range.

Integrated Tool Chain

AB Dynamics provide a synergy of solutions for ADAS testing. Our aVDS has consistent front-end software and control system hardware as our track testing products, such as driving robots and ADAS platforms, all using our patented Synchro software. This allows multiple validation approaches as the same scenarios can be tested in the lab and validated on the track.



Applications

The simulator can be used across a breadth of applications, including ADAS and autonomous systems, NVH, hardware-in-the-loop, software-in-the-loop and driver monitoring.

Faithfully recreated vehicle dynamics can be experienced in a variety of common tests, including: lane change, slalom, braking in turn, impulse, sine, step, ramp, swept steer and more.

The ability to spontaneously change suspension parameters or to conduct complex automated manoeuvres in chaotic traffic conditions is a level of capability that engineers dream of. The aVDS gives you unparalleled flexibility and freedom without compromising safety.

aVDS Motion Platform Performance

"The aVDS has a low latency of less than 10ms which is necessary for limit handling and means that extremely small parameter changes can be felt as a result."

Felix Scott, Independent expert test driver and tuning engineer.

"High calibre motorsport drivers are able to make statistically significant chassis tuning changes considerably smaller than 0.5%"

Dr. Adrian Simms, Business Director at AB Dynamics.

Degree of Freedom	Displacement aVDS	aVDS Frequency Response (-3dB)
Surge (X)	±540mm	>15Hz
Sway (Y)	±1250mm	>35Hz
Heave (Z)	±120mm	>50Hz
Roll (Alpha)	±8°	>50Hz
Pitch (Beta)	±9°	>50Hz
Yaw (Gamma)	±30°	>35Hz



Haptic Feedback

AB Dynamics is one of the world's most trusted suppliers of automotive test systems having supplied and supported steering robot systems for more than twenty years. This experience has been utilised to design the company's own control loading devices including the motors because this is so critical to simulator performance.

Motion Cueing

Motion cueing is a vital element of any driving simulator. A wide range of algorithms developed over many years are provided as standard with the aVDS, giving users the ability to choose the best option to meet their own requirements.

Maximise Test Time

The long-established motion platform design making use of linear motors delivers a system that is extremely robust and requires negligible user performed maintenance. There is also no need to schedule in down time for expensive part replacement intervals. Efficient testing through software is a core skill of AB Dynamics.

Ease of Installation

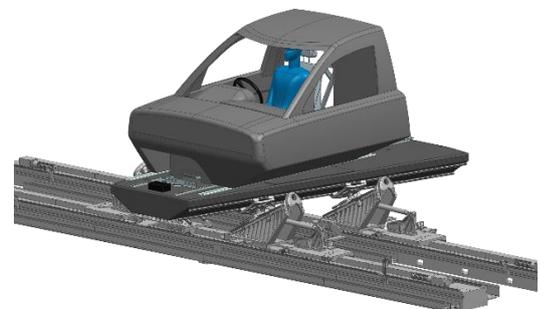
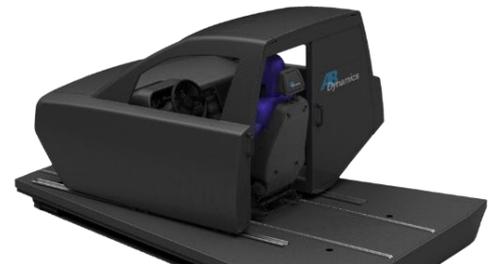
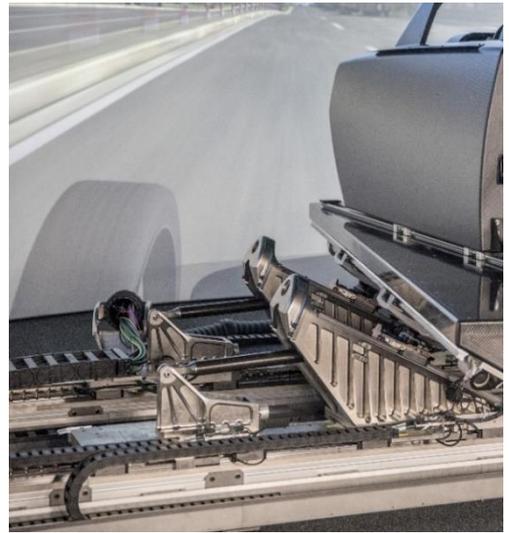
There are no onerous installation requirements relating to seismic mass for the aVDS family of products. Installation locations are not limited to the ground floor of a building and the system setup allows easy upgrade of static simulators to enable motion.

Immersion

Immersion is critical to maintain the authenticity of the driver's experience and reactions; therefore, digital content is provided by industry-leading software supplier rFpro. The experience of driving the aVDS is so involving and detailed that seasoned drivers can detect incremental parameter changes as if they were in the real car. Thanks to the high road surface fidelity reproduced by the aVDS, simulated results and data correlate closely with those attained by physically driving a real vehicle on a specific road or track. Visual, audio, haptic and vestibular cueing ensures that the driver is fully engaged with senses stimulated for an unmatched level of realism. The platform's motion and visual feed have been precisely synchronised to eliminate the motion sickness often experienced when operating driving simulators.

Built for you

The specifications of each aVDS is tailored to the customer. We build the simulator that meets your requirements, working with you to determine the most suitable package - whether you need stereo projection for 3D visuals, a custom lightweight cabin or additional computational power.



A name you know, support you can trust

Our experience working with numerous proving grounds and the world's most prominent vehicle safety organisations, like Euro NCAP and NHTSA, has given us key insight into the rigours of vehicle development and testing. Critically, with over 30 years of experience developing systems for the 25 largest vehicle manufacturers in the world, we designed the aVDS to address the industry's present and future requirements. It is not just a simulator, it is an incredibly powerful vehicle development tool and, as our customers will attest, we are ready to provide the training and support necessary to ensure that you can utilise its full potential.



Get in touch with us today to find out more information about this leading motorsport development, including performance data:

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