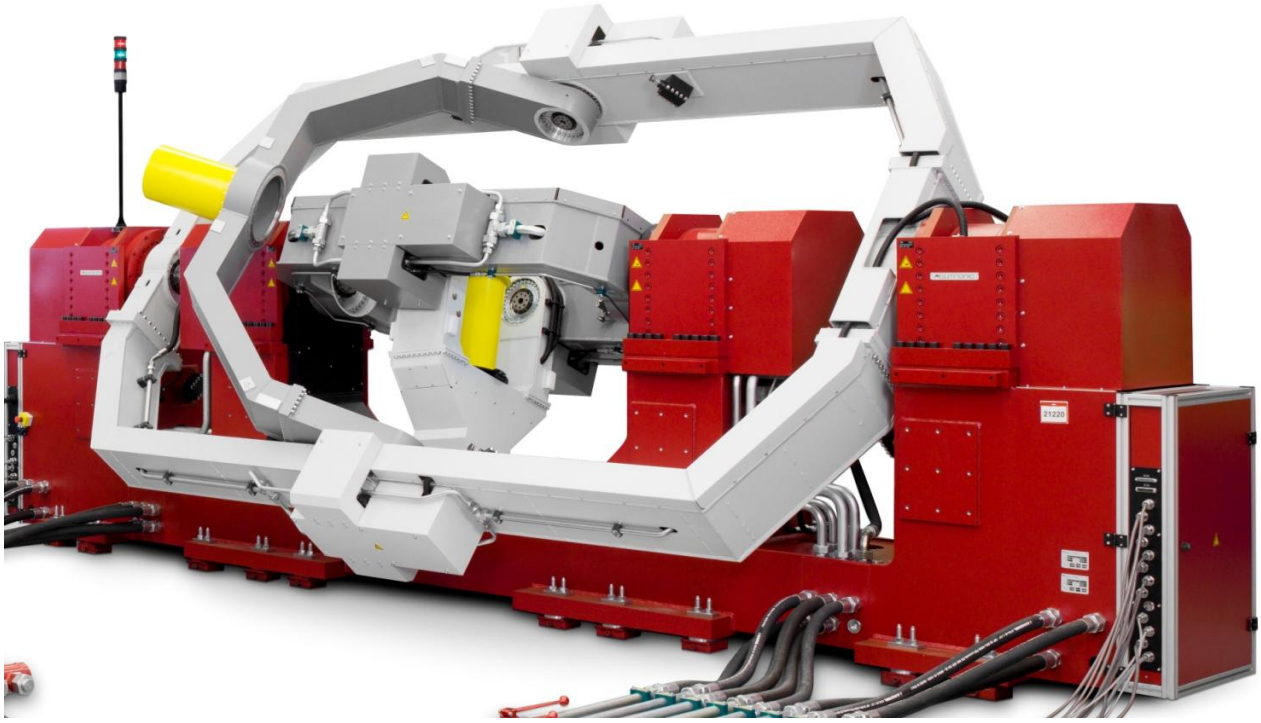
ACUTRONIC

The Driving Force in Motion Simulation

HD55 Series HardWare-In-the-Loop Flight Motion Simulator

5-Axis Flight Motion Simulator HD55H-T35.50



The HD55H-T35.50 is a precision 3-Axis Flight Motion Simulator (FMS) combined with a 2-Axis Target Motion Simulator (TMS). The system is specifically designed for the Hardware-in-the-Loop (HWIL) testing and evaluation of high dynamic Infra-Red and Electro-Optical missile systems and sensors.

The 3-Axis FMS is configured with a horizontal outer (pitch) axis, a middle (yaw) axis, which is orthogonal to the outer axis and an inner (roll) axis supported by the middle axis gimbal.

The inner axis has continuous angular freedom and is driven by a high torque brushless motor. A slip-ring assembly mounted to the rear of the inner axis facilitates the transfer of power and data signals to the Unit Under Test. A high pressure on-axis rotary coupling incorporated into the slip-ring assembly caters for the cooling requirements of systems with cooled detectors. A hard-anodized aluminum 'table-top' on the roll axis serves as the Unit Under Test mounting surface.

The middle and outer axes have maximised angular freedom of motion and are driven by hydraulic actuators to liberate high dynamic performance.

The 2-Axis TMS is hydraulically actuated and is configured with an outer elevation axis which supports the inner azimuth axis. The Unit Under Test target source is mounted to a dedicated attachment area on the azimuth gimbal.

Construction materials used are treated for long term dimensional stability. The stiffness of the system is such that orthogonality of the axes and bearing wobbles are maintained, virtually independent of axis rate or position. Protective coatings are used to prevent corrosion and outer surfaces are painted.

The real time digital controller ACUTROL®3000e controls the motion simulators. The controller has a colour, touch sensitive operator interface flat panel display and scalable analog input/output interfaces. Programmable Event Pulses can be used for calibration and synchronization with external computers or test equipment.

Real Time SCRAMNet® or VMIC Reflective Memory® interfaces are provided and complemented with Ethernet (TCP/IP) for non Real Time applications.

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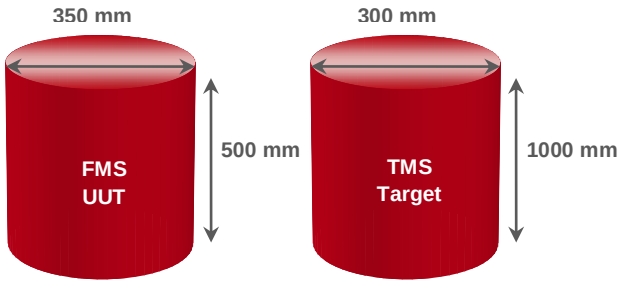
Payload	
Mass (FMS Unit Under Test)	30 kg
Mass (TMS Target Source)	50kg
Slip-rings to UUT	Signal 46 ways, 2 A @ 150VDC Power 5 ways, 20 A @ 400VAC Cooling 1 way, 350bar



Specifications	FMS			TMS	
	Inner Axis	Middle Axis	Outer Axis	Inner Axis	Outer Axis
Angular freedom	Continuous	±55°	+90/-130°	±55°	±45°
Position					
Accuracy	≤0.003°	≤0.003°	≤0.003°	≤0.003°	≤0.003°
Command resolution	≤0.0001°	≤0.0001°	≤0.0001°	≤0.0001°	≤0.0001°
Repeatability	±0.0005°	±0.002°	±0.002°	±0.002°	±0.002°
Rate					
Maximum	±7200°/s	±400°/s	±400°/s	±100°/s	±100°/s
Minimum	0.001°/s	0.001°/s	0.001°/s	0.001°/s	0.001°/s
Command resolution	≤0.0001°/s	≤0.0001°/s	≤0.0001°/s	≤0.0001°/s	≤0.0001°/s
Dynamic					
Bandwidth (Small Signal)	≥40 Hz (-3dB / -90°)	≥30 Hz (-3dB / -90°)	≥25 Hz (-3dB / -90°)	≥10 Hz (-3dB / -90°)	≥10 Hz (-3dB / -90°)
Acceleration (with load)	32'000°/s^2	12'000°/s^2	12'000°/s^2	1'200°/s2	1'200°/s2
Mechanical					
Orthogonality		≤30arc sec		≤30arc sec	
Intersection Accuracy (Sphere)		≤1mm		≤1mm	
Field of View	±55°				

Major Simulator Dimensions	
Simulator (L x W x H)	6.5m x 3m x 2.8m
Table Top Offset (Centre of Rotation to Table Top)	500 mm
TMS Mounting Surface to Centre of Rotation	1315 mm
Intersection of Axes (Floor to Centre of Rotation)	1821 mm

Options

- Custom Slip-Rings
- Custom UUT and Target Mounting Adapters

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The specifications identified in this data sheet are representative of standard systems.
ACUTRONIC is able to custom design systems to meet customer specific requirements.