

# ADAS Closed-Loop HIL



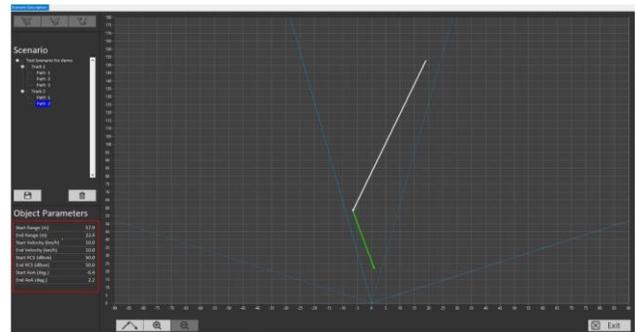
ADAS Closed-Loop HIL System allows Automotive OEM companies and their suppliers to test their ADAS Systems in a controlled in-lab environment, thus minimizing the time and resources spent on real-world drive tests. The System simulates events happening in the virtual-world for the ADAS system, consisting of numerous components, such as Automotive RADARs, Cameras, LiDARs, GNSS receivers and ECUs, and does the functional testing of the full system in a closed-loop HIL environment.

ADAS-HIL Platform consists of the following components

- Hardware-in-the-loop system for ADAS ECUs
- Automotive RADAR Target Simulation System
- Camera Optical Projection System
- Automotive LiDAR Environment Simulation System (optional)
- GLONASS/GPS Signal Simulator (optional)



*ADAS-HIL Software Suite*



*RADAR Environment Simulation Software*

# ADAS Closed-Loop HIL

## Technical Specifications

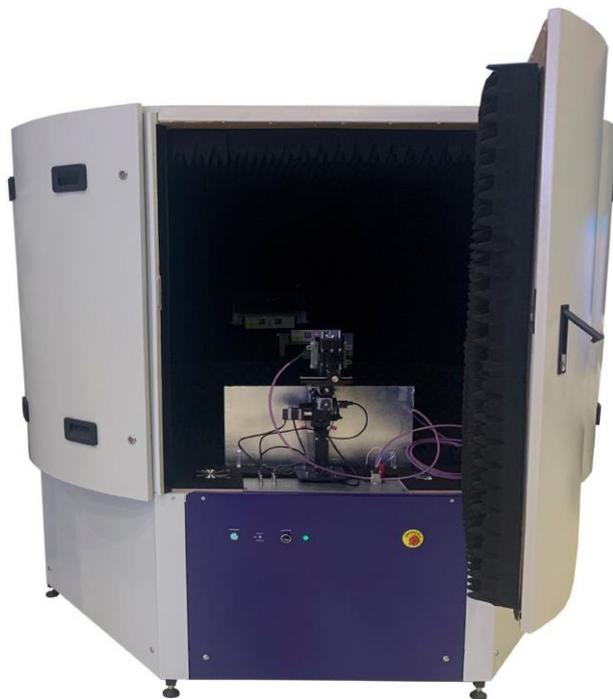
Hardware-in-the-loop system for ADAS ECU	
Connection to ECU	CAN (500 kbps to 1 Mbps)
Number of Channels	2 (scalable to 28)
Prebuild Scenarios for ADAS	ACC, AEB, LDW/LKA, SAS (Support for Euro NCAP scenarios)
Signals Exported to ECU	ESP Module Signals EMS Signals ABS Signals Steering Wheel Unit Signals Transmission Control Module Signals Powertrain Control Module Signals <b>Optional</b> Simulated LiDAR and RADAR Signals Camera Video Stream Acceleration/Deceleration (m/s <sup>2</sup> )
Signals Imported from ECU	Steering Wheel Angle (degrees) ADAS Instrument Cluster Warnings Fixed Obstacle Distance (for ACC and AEB)
Real-Time Target Rate	1 kHz (100 Hz when exporting Simulated LiDAR and RADAR Signals)



# ADAS Closed-Loop HIL

## Automotive RADAR Target Simulation System

Number of Targets	4 objects (2 AoA)
Minimum Simulated Range	6 m
Maximum Simulated Range	>300 m
Range Resolution	10 cm to 12 cm
Minimum Simulated Velocity	0 km/h
Maximum Simulated Velocity	±500 km/h
Velocity Resolution	0.1 km/hour
RCS	50 dB of range
RCS Resolution	1 dB
Frequency	User Configurable: 76 GHz - 77 GHz Factory Configurable: 76 GHz - 81 GHz
Bandwidth	1 GHz
Antenna Configuration	Mono-static and bi-static configurations



# ADAS Closed-Loop HIL

## Camera Optical Projection System

Video-interface from PC	HDMI
Camera Under Test FOV	35° - 45° (scalable, using Custom Optical Cartridges)
Frame Rate	120 Hz (8 ms response time)
Mechanical Fixture Size	Scalable
Form-Factor	Rack Mounted (9U)

