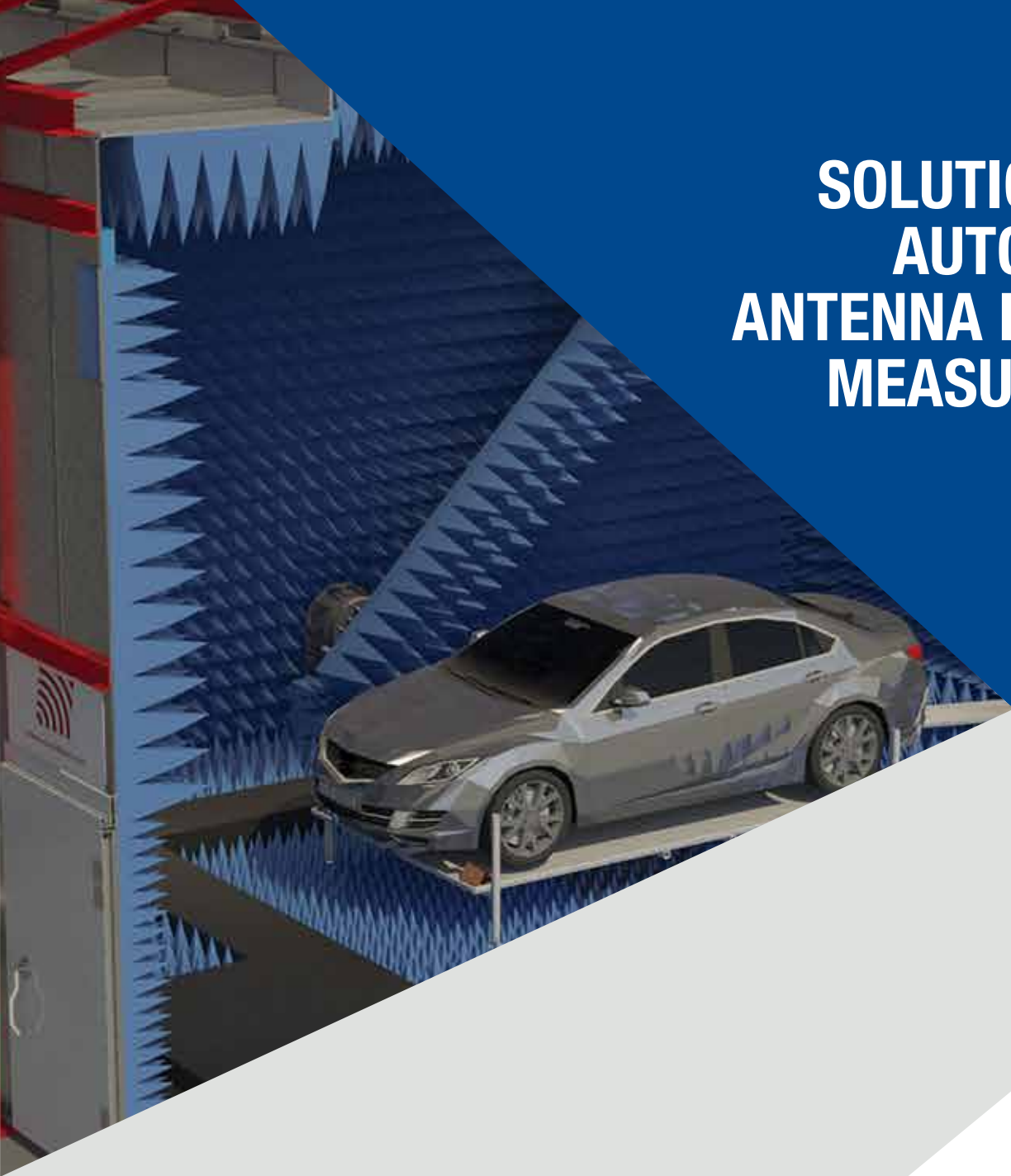


SOLUTIONS FOR AUTOMOTIVE ANTENNA PATTERN MEASUREMENT (APM)



BEYOND MEASURE.™

 **ETS·LINDGREN**[®]
An ESCO Technologies Company

ETS-LINDGREN IS AN EXPERIENCED PARTNER YOU CAN TRUST

THE LEADER IN AUTOMOTIVE TEST AND MEASUREMENT INTRODUCES ITS NEW SERIES OF AUTOMOTIVE ANTENNA PATTERN MEASUREMENT (APM) TESTING SOLUTIONS

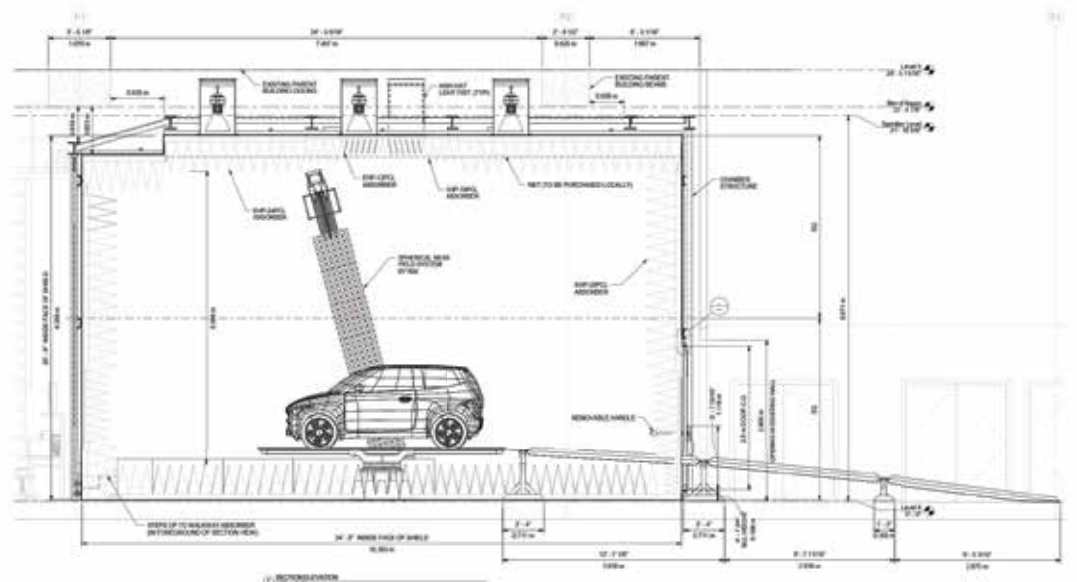
ETS-Lindgren's Automotive Antenna Pattern Measurement Solutions comply with IEEE Std 149¹ and IEEE 1720-2012¹ industry standards.

The future of vehicular transportation is here. Today's technology has been advancing at a rapid pace as modern vehicles are fitted with an exceptional level of computerized automation. Future vehicles will be even more state-of-the-art, relying increasingly on communication with other vehicles (V2V) and with fixed transceivers (V2I). These vehicles will also include multiple antennas of different types, covering a broad range of frequencies, protocols, and modulations. In parallel with this is the development of supporting Intelligent Transport System (ITS) test standards within groups such as ETSI, to be adopted globally.

The traditional whip antenna used for many years for AM/FM reception has quickly given way to more advanced, integrated antenna designs to meet today's new requirements. However, the performance of many designs is still influenced by the ground plane or other proximity effects. On any vehicle platform there are often several model variants that also provide added impetus for changes in location and mounting of an antenna. Measuring the pattern of an installed antenna and the Over-the-Air (OTA) performance of the related channel are becoming increasingly more important as we move closer to wider system integration and full vehicle autonomy.

ETS-Lindgren has many years of experience with cellular and microwave APM as well as with cellular OTA measurements. Together with our industry leading partners, we provide a range of reliable, high performance and cost-effective solutions for measuring the parameters of antennas installed on actual vehicle platforms.

TYPICAL AUTOMOTIVE APM CHAMBER TEST SETUP



¹ These are generic antenna standards, not specific to any mounting platform.



AUTOMOTIVE ANTENNA PATTERN MEASUREMENT TEST SPECIFICATIONS

TYPICAL CONFIGURATION

ETS-Lindgren's antenna measurement solutions cover a wide range of vehicle sizes and frequency bands. Chamber system designs are available for antenna pattern measurements from 70 MHz to 6 GHz for the standard communication bands, with options for extension to 40 GHz for 5G and 90 GHz for RADAR. A typical system for "Passenger and Small Commercial Vehicles" is described below. Should you have different testing requirements, please contact your ETS-Lindgren representative for a customized solution.

Physical Specifications

Item	Description
RF Shielding	Modular RF Shielded Enclosure – Inside Shield Dimensions: 10.36 m x 7.32 m x 6.3 m (33.99 ft x 24.02 ft x 20.67 ft) – Estimated Overall Dimensions: 10.85 m x 7.92 m x 7.3 m (35.60 ft x 25.98 ft x 23.95 ft)
Test Volume	5.00 m x 2.00 m x 1.50 m+ 16.40 ft x 6.56 ft x 4.92 ft+
Maximum DUT Weight	2,500 kg 5,511 lb
Frequency Measurement Range	150 MHz to 6000 MHz, Optional Higher Frequency Available
Measurement Type	Near-field Hemispherical 3D Antenna Pattern (Theta Over Phi)
Absorber Treatment	Walls, Ceiling: EHP-24PCL Floor: EHP-24PCLWW
Near-field Scanner	NSI-MI Technologies' Automotive Antenna Test System to Include: – Spherical Near-field Measurement System – 3-Dimensional Near-field Swing Arm System – Over Hemisphere (> ± 95°) Spherical Scan Area – High Capacity Version of NSI-SC-5638 Turntable Positioner (Phi Axis) – NSI-SC-5638 Rotation Stage (Theta Axis) – NSI-SC-5633 Rotation Stage (Pol Axis) – 25 MHz to 6 GHz Probe Antennas – Three (3) 26.5 GHz Rotary Joints – Spherical Alignment Tool Kit – Measurement Workstation Computer with Large LCD Monitor – System Controller, Electronics, and Motor Cables – Antenna Measurement Software – System Documentation – Keysight 8.5 GHz ENA Based RF System – H Platform and Multiple-section, Removable Ramps

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