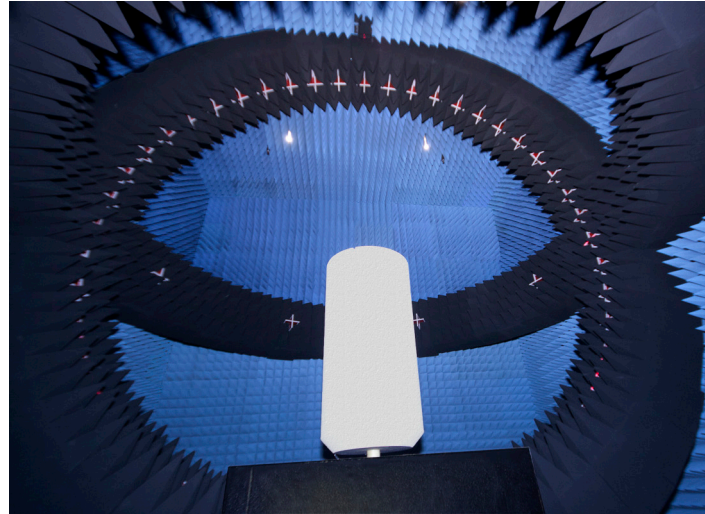


FEATURES:

- **For LTE, WiMAX, and 802.11n MIMO Testing**
- **Acceptable for Evaluation of Receive Diversity**
- **Complete RF Environment Simulation**
- **Supports Single Cluster, Multiple Cluster, and Uniform Models**
- **Supports Variable Angles of Arrival, Doppler, and Delay Spread**
- **Patent Pending Technology**



ETS-Lindgren's Model AMS-8700 MIMO Test System (Horizontal Array) Shown with Optional AMS-8900 High Speed APM (Vertical Array)

ETS-LINDGREN'S MODEL AMS-8700 MIMO OTA TEST SYSTEM

allows repeatable measurement of radiated performance of wireless devices in a simulated multi-path environment. The system acts as an RF environment simulator that can generate spatial field structures similar to those seen in a wide range of real-world scenarios. Standard conducted channel models can be adapted to equivalent radiated spatial channel models for evaluation of the entire device signal chain, including antennas, device platform, and near field phantom (head, hands, etc.) impact on device performance. The simulated environment is suitable for evaluation of downlink MIMO performance for emerging wireless technologies such as LTE,

WiMAX, and 802.11n Wi-Fi as well as receive diversity performance of existing wireless technologies.

The system consists of a dual polarized antenna array in an absorber lined fully-anechoic chamber connected to technology specific communication test equipment through a spatial channel emulator. The anechoic chamber provides isolation from interference and reflections in the real-world environment and eliminates unwanted reflections within the test environment. The antenna array transmits downlink signals from a range of angles of arrival (AoA) simulating the scattered reflections seen by a wireless device in normal operation. The spatial channel emulator uses specially modified spatial channel models to

feed each antenna in the array with a statistical sampling of the source signal(s) with appropriate Doppler and delay spreads to emulate the scattering effect of fixed and moving objects within the simulated environment. A positioning system allows the wireless device under test (DUT) to be rotated through the generated field structure to determine its relative performance in different orientations within the simulated environment.

ETS-Lindgren's EMQuest EMQ-108 MIMO OTA Test Option adds a suite of test capabilities to the EMQuest EMQ-100 Antenna Measurement Software. These include specialized tests for evaluating the throughput of a wireless device in the simulated environment, as well as R&D tests

to allow evaluation of antenna correlation, along with system calibration and validation tests. The baseline system configuration provides a simulated environment suitable for testing typical wireless handsets. Optional configurations are available to increase the uncorrelated test volume. Optional system components add support for antenna pattern measurement and traditional SISO Total Radiated Power (TRP) and Total Isotropic Sensitivity (TIS) testing of wireless devices. An optional theta axis array and high speed switch matrix allows for high speed* antenna pattern measurement and TRP/TIS testing.

In 2002, ETS-Lindgren designed and installed the industry's first CTIA Authorized Test Lab (CATL). Today, over 75% of all CATL's worldwide are equipped with wireless test systems manufactured by ETS-Lindgren. The company maintains its leadership position through active participation in the industry standards committees that drive the performance testing of wireless devices, such as CTIA-The Wireless Association®, the WiMAX Forum® and 3GPP.

STANDARD CONFIGURATION Shielded Room

- RF-Shielded Enclosure with Interior Shield Dimensions of 4.9 m x 4.9 m x 3.7 m (16' x 16' x 12')

- RF Shielded Manually Operated Door
 - Nominal Dimension: Single-leaf 1.21 m x 2.13 m (4' x 7')
- Waveguide Air Vents
 - Nominal Dimension: 30.5 cm x 30.5 cm (12" x 12")
 - Located in Chamber Ceiling
- Power Line Filters
 - One for Convenience Outlet
 - Two for EUT
 - One for Positioner
- Fiber Optic Light Fixtures
- Penetrations, Panels & Connectors
 - Bulkhead Connector Panels
 - N-type Connectors
 - SMA Connectors
 - Fiber Optic Penetration Kit
- Floor & Ground Plane
- Design & Installation

Anechoic Absorber Material

- Sidewall and Ceiling Absorber treatment
 - EHP-12PCL
- Floor Absorber Treatment
 - Combination of EHP-12PCL and WW-12PCL

Baseline Equipment and Software

Antennas

- 8 MIMO Dual-polarized Environment Simulation Antennas
- Model 3102 Conical Log Spiral Communication Antenna

- Model 3102L Conical Log Spiral Communication Antenna
- Cabling and Connector Package

Equipment

- 8-port LNA Power Amplifier
- MIMO Antenna Structure
- Medium-Duty MAPS
 - Removable Medium-duty Attachment for Phi Axis Positioning
- Light Duty Mast Shaft Accessory for Testing Handset Devices Weighing up to 0.45 kg (1.0 lbs) Including Free Space Mount Kit for Mobile Phone Testing
- Laptop Mount Kit for Medium-duty MAPS
- Free-space Phone Mount Kit
- CTIA Ripple Calibration Antenna Mount Kit
- CTIA Ripple Calibration RF-Cable Kit
- 5-beam Laser with Tripod for Leveling the MAPS Unit

Software & PC

- EMQuest™ EMQ-100 Antenna Pattern Measurement Software
- EMQuest™ EMQ-108 MIMO OTA Test Package; Includes Throughput Testing Capabilities (Customer Provides Throughput Measurement Package, i.e. IxChariot™; Supported by EMQuest™)

* High speed refers to the removal of test time associated with positioning

- Dell Computer Including an Intel® Quad™ Core 2 3.0 GHz processor, 4 GB DDR2 800 MHz SDRAM, 320 GB HDD, CD-RW/DVD Combo Drive, PCI GPIB Card and Windows XP® Business Edition

Performance Testing & Integration

- Shield Verification Test in General Accordance with the Test Methods of MIL-STD-285 / IEEE-299 at 1 GHz Plane Wave Field. Shielding Performance is Guaranteed Prior to the Installation of System Components such as the Antenna, RF Cabling, etc.
- Integration and Initial Calibration of the Test System Components and Training of Lab Personnel on the Use of EMQuest™ EMQ-100 Software for MIMO Testing

OPTIONS

- 16-Antenna Array Upgrade
- High Speed SISO Testing Upgrade
- Optional SAM Mounting Kits
- Optional Precision Sleeve Dipoles
- Optional Equipment Drivers
- Optional EMQuest Software Expansion Packages